GLEANINGS IN BEE CULTURE

A JOURNAL DEVOTED TO BEES AND HONEY AND HOME INTERESTS

ILLUSTRATED SEMI-MONTHLY

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STRAY STRAWS FROM DR C. C. MILLER

DISCREPANCY between statements on pp. 170 and 186 as to high board fences being bad or good for bees. Wonder if the thing doesn't vary as to locality.

THAT HOME TALK of A. I. Root, last number, made me think what a reliable set in general bee-keepers are. I never lost a cent by one of them except once.

DOOLITTLE says he's using foundation more than two years old. Say, Doolittle, last year I used lots of brood foundation six years old, and I couldn't see but it was as good as new.

HARD MAPLE grows fast, according to a statement on p. 168. Any thing but fast, "in this locality." [Very slowly here, and yet all depends on what is meant by "slowly." That is a relative term.—ED.]

"IT IS NEEDLESS to sacrifice a *whole* apiary to any single experiment," says Doolittle, p. 183. Of course it is; but why couldn't you tell me of my faults privately, Doolittle, instead of coming out in that public manner?

I'M REQUESTED to tear in pieces C. P. Dadant for so strongly advocating big hives. The trouble is, I can't find out whether he's right or not. In the meantime I might set on him my good friend D. N. Ritchie, the man who gets good crops of honey with marvelously small hives.

"I WOULD STEAL before I would go to the poorhouse," A. I. Root thinks is false pride. I should say so. When you simmer it down, that means, "I'd rather steal $100 from a single person than to take it honestly from a lot of people who are willing to make me a present of that amount."

DZIERZON offers a new kink. Clip both sides of a virgin queen in the house before a window till she flies with some difficulty, and she'll be fertilized near home (Aspinwall's idea), and then when she gets to laying she'll need no other clipping. [This will be a rather delicate job. In actual practice I should expect that either there would be too much clipped off the wings, so the queen would get lost, or not enough so but she could fly just as far as she pleased.—ED.]

THE SUM OF $30,000 was lately paid for a new carnation. Yesterday I stood admiring a vase of the flowers in Chicago. Pulling out my rule I found each measured fully 3 inches across, and I thought, "When so much can be done with a flower, why can't red clover tongues be produced in bees, and also non-swarmers?"

KEEPING HUSHED UP the presence of foul brood, as mentioned p. 176, seems about the natural thing to do, but there may be a little question whether it's the best thing. Where there's a case of smallpox I've known the family very anxious to have it hushed up; but the public authorities insisted on having the house very distinctly placarded "Smallpox!"

A. E. MANUM doubts "that bees purposely make use of foreign substances" in cappings. If he will turn to Cheshire, p. 174, he can see a picture of brood-capping magnified 35 times, and will learn that the *major portion* of brood-cappings is made up of nibblings and scraps, cocoons, and pollen-grains, and from this same contamination "not even the cleanest super-comb is free."

IN REPLY to H. L., my best colonies have perhaps 13 frames of brood at beginning of clover harvest, the average being 8. How is it at Medina? [My best comb and extracted honey colonies (and you know I run for both on the same hive) would have ten and twelve frames of brood; but about the time honey begins to come in well, if the season holds out I get them on to about eight.—ED.]

THAT CONSOLIDATION of 18 swarms, p. 174, reminds me. Years ago I visited E. D. Godfrey, Red Oak, Iowa, and he gave me a vivid account of an experience he had had. I think it was 60 colonies that were taken out of cellar in spring, and about all of them swarmed out at the same time! The air was black with them, and they went back into only a small number of the hives. He candidly admitted that it made him so sick he went straight to bed. I think he afterward did something to even them up.

CRITIC TAYLOR comes up smiling in *Review* with a new argument in favor of boiling foul-broody honey only 15 minutes. The specific gravity of honey is nearly a half more than that of water, hence when you boil honey you make it a lot hotter than 212°. I don't know the proper reply to that, so I've taken to the fence, and am looking for a soft spot to alight beside Bro. Taylor. Gather up your duds, Ernest, and come along. But I wish some one would tell us just how hot boiling honey is. [See editorials.—ED.]

EDITOR HUTCHINSON and C. P. Dadant are at loggerheads as to the expense of queens in spring. One says they are the *least* expensive part of a colony, the other says they are the *most* expensive part. Hutchinson says when bees swarm they build a lot of queen-cells, and "the building of these cells and the feeding of the embryo queens cost the bees some labor, and that is all that queens cost the regular honey-producer." That wouldn't make them cost 10 cts. each ; but getting them fertilized and keeping them through till spring will make them cost 90 cts. more.

A HEDGE OF EVERGREENS is a fine thing to slow up the wind in winter, but you must remember that it will also slow up a breeze in summer, so that, with a dense hedge on east and west side, combs may melt down in a hive in dense shade. [Yes, it is true that, while evergreens make most excellent windbreaks, they produce almost a dead calm under a hot pouring sun in summer. Our apiarists have often complained about its being so "dreadfully hot" in our apiary in the summer, and I suppose it is because of those same evergreens that are so useful in winter but so useless in summer.—ED.]

I'M ASHAMED TO SAY I had forgotten that Cheshire gives what is probably the true cause of the blackening of brood combs, that is the residua of the bowels being "plastered outside the exuvium, within the cell-wall." As to darkening in supers, J. E. Crane is sound, and we may as well dismiss the dirty-foot business entirely. But I do think that bees add dark material to the *outside* of white cappings when left long enough. [I believe that Crane and Cheshire are, on the whole, correct, although I am inclined to the opinion that propolis has probably as much or more to do with discoloring honey than pollen.—ED]

I'D LIKE TO SEE Doolittle use tin separators 20 years without cleaning, where I live. He'd have to enlarge his supers. [Yes, yes. Dr. Miller, if my memory serve me correctly, has more real propolis to the square foot than Doolittle has to the square yard. My comparison may not be accurate, but I know there is a vast difference. In the State of New York, fixed or self-spacing frames are used very largely ; in Illinois, very sparingly, at least in the northern part of the State. There can be no question but that, in this matter, locality does have a great deal to do with one's ideas and real practice.—ED.]

SOME MAY HAVE a misunderstanding from the statement, p. 176, that Ontario has proportionately less foul brood than any other country. Foul brood has just started in Belgium, if I am rightly informed, and I think there are countries where foul brood is unknown to bee-keepers. [I hope there are many countries and States where foul brood is unknown. It begins to look as if, next season, there would be a good demand for bees, owing to the fact that there will be rather heavier winter losses this year than last. Sending bees in the form of nuclei is very liable to carry foul brood, if those nuclei come from a locality that has been or is infected with the disease. —ED.]

"THE SIDES of the cells are porous, also the cappings," says James Cormac, page 180. Brood-cappings are porous, cappings of honey less so, Cheshire finding about one cell in 16 not porous; but he found no porosity whatever in the walls of cells. [I think we may safely say that the cappings of both brood-cells and honey-cells are porous. One does not need to consult any authority to prove that; but if one will take a strong glass, and inspect the sides of honey or brood cells he will see that they seem to be more dense, and are probably impervious to air. We know that honey ripens somewhat after it is capped over, and there is no way it could ripen unless the cappings were porous.—ED.]

"BEST THING in the line of an interview I ever heard from a bee-paper," said my auditor when I finished reading the Root-Crane interview, p, 169. [The Crane part of it was all right. Some little time ago, when I had that little chat (interview) with Chalon Fowls and H. R. Boardman, I regretted that we did not have our stenographer on hand to take down in permanent form the valuable suggestions that were thrown out. It is my purpose to introduce this feature in the future as often as conditions will permit; so that those of our bee-keeping friends who come here must not be surprised if they are put through a course of questions—not so much to see how much they know, but to pump out of their wells of knowledge as much as they are willing to give.—ED.]

"YOUR CHOICE for 16 cts.," marked over a dozen sections (p. 168) will work all right if sections weigh alike ; but if there's a difference of several ounces between the heaviest and lightest, won't the last go a little slow? [Mr. S. A. Niver, who is an advocate of selling honey by the piece, grades his honey, if I am not mistaken, both by appearance and weight. I think that he told me he could gauge his honey to the half-ounce by merely picking it up and looking at it and setting it in its proper grade. That takes practice. When honey is sold by the piece, every section box is very nearly an average of every other one in that same case; if it is not, then the customer will soon demand to buy by weight. I do not remember whether Mr. Niver is the one or not; but some one has cases of full-weight fancies and light weight; also full cases of full weight No. 1 and light weight No. 1, and so on. The light weights are sold to one set of customers, and the heavy weights to another.—ED.]

RAMBLER springs a tough conundrum in *Review*. Why is it that, when you're at work near the apiary, only two or three bees will persistently pester you when there might as well be a thousand? I don't know. But when he says, "If you knock all of them down it will not take five minutes for their places to be filled by another two or three," I demur. We eat our dinner under a certain tree in the Hastings apiary, and when we've batted the two to six scolding bees, the *rule* is that we can eat our dinners in peace. [With me it has worked both ways. Sometimes after killing off the two or three that seem to delight in making one crosseyed, that has ended all further annoyance. Then at other times it has seemed as if every time I struck one, another would take its place—if not at once, shortly after. As a general rule I find it pays, however, to kill off these teasers; for when they once get into this habit of following one about the yard, those very same bees, if not killed, will keep it up for days. I remember quite distinctly one of these bees that had defective wings. Its hum was quite characteristic; and after two or three days of real annoyance I remember saying, "There comes back that little rascal again. I will fix him." I did fix him, and straightway that peculiar hum or whirr stopped. You see it was more natural to say I would "fix him" than to "fix it" or "fix her."—ED]

"The March winds roar around our door,"
The bees say, quite demure;
"It shakes my *frame*," says one scared drone,
"Yet our *foundation's* sure."

AMERICAN BEE JOURNAL.

The first and second items on the second column of page 168, previous issue, should have been credited to the *Amer. Bee Journal* and not to the *Bee-keepers' Review*.

Mr. McNay says bee-keepers should demand an advance on honey sent to commission men, otherwise the honey will usually be put in the back part of the warehouse, and will be the last to be sold.

In speaking of the relative qualities of honey gathered by blacks and Italians, Mr. Edward Bevins, of Iowa, says he does not "question the fact of the better taste of the product of Italian bees. . . But that this superiority is present at all times and under all circumstances may well be questioned."

C. P. Dadant thinks it beneficial to let bees fly out on warm days, to avoid constipation. He does not favor excessive ventilation of hives, such as results from having the bottom of the hive removed; says it is like sleeping in a room with the window open in the winter. Probably "locality" will cut quite a figure in this matter.

In the issue for March 2 Mr. J. H. Martin furnishes a full description, with illustrations, of the California blue-gum and red-gum trees of that State. The blue gum (eucalyptus) is called the giant honey-producer. Mr. Martin says he has not seen a larger tree in America that secretes honey. Mr. M. has known the blue gum to bloom continuously from December till May and June. The honey from it is very dark, and aromatic in flavor. The tree grows very fast.

Mr. William Stolley, of Nebraska, gives a remarkably interesting talk on sweet clover—how to raise it, use it, and control its growth. Among many good points he makes I note the following: "In Nebraska it will furnish most excellent bee-pasture up to the time when frost kills all vegetation, and sweet clover is the very last to succumb. For early spring pasturing of cattle, particularly milch cows, there is nothing better than sweet clover." "It runs out all noxious weeds, perfumes the air, and feeds the bees." "A public road, well and evenly seeded with melilot, but the growth of it properly checked at the proper time, is a thing of great beauty, and there is nothing bad about it, but, instead, it furnishes a bee-ranch hard to beat." Mr. Stolley admits, however, that it is objectionable on original prairie-grass land which is to be utilized as hay land. It would be a good thing if the whole article could be printed in every agricultural paper in the country.

O. O. Poppleton speaks of the insect pests of Cuba. It makes us doubt what the poet said of these tropical countries—

"——every prospect pleases,
And naught but man is vile."

One of the "vile" things they have there is the mosquito; but these insects are not so bad as in Florida, are easily scared away, and can be kept away at night by the use of screens. The flea is to be found in Cuba in all his glory. Mr. P. says: "The more we kept away from any place where any kind of animal was kept, the less we were troubled with them." Then comes the chigoe, a black flea, so small as to be almost invisible. "These fellows burrow just under the skin, usually at the side of one of the toe-nails, and then proceed to grow into a bag full of eggs. I think that the abdomen of the insect itself distends as the eggs grow in size. The first that one knows of their presence is a peculiar itching, and an examination will show what looks like a white fester under the skin. A novice will open the supposed fester, squeeze out the eggs, and, if wise, drop in some kerosene to kill the insect and such eggs as will still remain. But the right thing to do is to take a pin, and, by being very careful, separate the entire egg-sac, without breaking it, from the flesh." Scorpions are plentiful in Cuba. Empty hives are a favorite place for them. Mr. P. says he has been stung by them only once. He thinks

the sting is not much more severe than that of a bee. See Mr. Somerford's letter in another column.

AMERICAN BEE-KEEPER.

A Pennsylvania writer says not a honey-bee could be seen on a field of crimson clover of his last year, but it was alive with bumble-bees.

Seven views of comb built by Carniolan bees are given, from the Ontario Agricultural College, R. F. Holtermann experimentalist. They are built, apparently, in brood-combs, L. size, and are quite as irregular in outline as an ordinary washing hanging on the line. They resemble a lot of smaller combs joined together in a jumbled-up mess. The editor thinks the average Carniolan colony would be ashamed of them.

In regard to nectar secretion, Fr. Greiner maintains, with every show of reason, that the same honey-plants are differently affected by different climates and localities. He says the cherry blossoms as well in York State as anywhere, but his bees seldom if ever get any honey from it, while in Virginia the same kind of trees yield honey freely. In one of Rambler's letters he speaks of the cherry-trees of Oregon as being a great place for bee-men. I am confident that around here they are of no value for honey. Watch our Apr. 15th issue.

G. M. Doolittle goes over the subject of fruit-bloom fertilization in a very thorough manner. I think I have never before seen so much on that theme, within the same compass. It is a real mine of information. I have just read an article in a French bee-journal, however, saying that bees have nothing to do with fruit-fertilization. Perhaps not, at all times, on the principle, as the little boy said, that "salt is what makes potatoes taste bad when you don't put any on."

A fine view of the apiary of Mr. A. A. Goetting, of El Casco, Cal., is given; also a picture of Mr. G. himself. He tried Cyprians in California, but had to give them up, as their jokes were too pointed. To get rid of a laying worker he tells us to "carry the hive a short distance from the apiary. Place upon the stand an empty hive, and in it put a frame of brood and eggs from a good colony. Shake all the bees off from the combs; replace the combs in the new hive on the old stand, and it is done."

A. E. Manum continues his articles on the size of hives. He concludes as follows: "In a locality with a honey-flow of long duration, and the bees run wholly for comb honey, and by a person who can give them close attention at all seasons, and also where an increase is desired, I would favor the small hive. But if no increase is wanted, and the location gives but a short honey season, and the feeding is to be avoided, I would by all means favor the large hive." Mr. Manum's wide experience gives weight to what he says.

"HE."

BY EUGENE SECOR.

[*Note.*—See GLEANINGS for Feb. 1, pages 80, 81.]

We hear a good deal of talk nowadays
  Concerning the sex that gathers our honey;
One man of letters writes, and boldy says,
  That she's a *he* (now, doesn't that sound funny?);
That *he's* the one that works, and always pays
  Our little bills when we're in need of money.
He cites a number of poets to show
That insects are called males, and *she* must go.

He says, and maintains, that if she's *not* he,
  She ought to be *it* according to rules
Evolved and explained so plainly that we,
  The laity, who, though innocent fools,
And Zaccheus-like (so curious to see),
  May learn about "functions" outside of schools.
But he failed to explain why the functionless steer
Is known as a *male* every day in the year.

Of course, it's quite plain to most of us *men*
  Why too much credit should never be given
To *female* importance; if it's *she*, why, then,
  As sure as the stars adorn the blue heaven,
The woman will claim again and again
  That *she's* the *factotum*, and not merely leaven.
It will never do to have it get out
That *females* are *workers* and bring things about.

When Nature exhibits some wonderful feat
  Performed by what *we* style the weaker sex,
'Tis lucky to have an old bach to cheat
  The dear woman out of th' possible reflex
By fooling the same in poetry sweet,
  By argument too, and logic complex.
The *masculine* gender's the best every time,
Because it is found *quite often in rhyme.*

Of all the wild fads now running round loose,
  The effort to make our speech very plain
Is faddest of all. A gander's a *goose;*
  But why admit that? it's simply insane—
'Tis running our necks in a feminine noose,
  So *gander's* the word that ought to remain,
Because, don't you see? some women will say,
"A goose ain't a gander, by a long way."

From this time on, then, *it* ought to be *he*
  Whenever we speak of the miscalled neuter.
Let's keep the old ruts, and not bend the knee
  To modern improvements, though it does seem cuter.
Young folks are too smart in this land of the free,
  And get too far from the time-honored tutor.
Let's teach this doctrine wherever we can:
The old-time angel was *always a man.*

HE OR SHE.

Its Use in Different Languages.

BY F. GREINER.

It has been the custom of all the English-speaking people to give the worker-bee the masculine pronoun *he*. I am not very certain that there has been any particular reason for this. No language, that I have gotten a slight inkling of, seems to be very consistent in conceding any particular gender to the things of this earth. How, for instance, may we account for using the masculine pronoun *he* when speaking of the sun, but the feminine, *she*, when speaking of the moon, especially when considering that the German has it right the opposite, while the other languages, again, like Latin, French, and Greek, have it the same as the English?

How can we account for it, that in the German we give the drone the pronoun *she*, but not so in the English? to the worker-bee the feminine *she*, yet not so in the English? Nearly all of us remember when the queen used to be called "king;" among the Germans, *Koenig* [king], and *Weiser* (*l*) [leader], with, of course, the masculine gender. This older usage, though, has substantially gone out of practice in a measure, so to speak, as the people have gained in knowledge.

The explanation of why there are so many inconsistencies in our languages lies, it seems to me, right here. Languages were made up greatly by ignorant, uneducated people. Language was first, then education. Can it then be wondered at that so many of these inconsistencies crept in — inconsistencies that now cause the student so much hard study? It seems to me that it is only a move in the right direction when we now try to rectify some of the greatest inconsistencies and blunders, wherever it may be done without much inconvenience.

I certainly was greatly pleased when the editor of GLEANINGS first started the reform in our bee-literature by giving the worker the feminine gender, to which it is rightfully entitled. As a German I had been used to styling the worker as *she*, as mentioned before, and I could not become reconciled to giving it the masculine pronoun *he* when learning the English language.

Mr. Hasty, in the December *Bee-keepers' Review*, expresses his opinion in this matter. He thinks the effort in behalf of this reform is born by a spirit of conceit, we thinking of ourselves as possessing greater knowledge than the laity; and it is not impossible that this may be true.

Further on Mr. Hasty tries to represent the worker from the "absolute-fact standpoint," and says the worker-bee is anatomically a female, but functionally a neuter, and should properly carry the pronoun *it*, etc. I grant that the mission of the worker has thus been described, and is looked upon by almost all, even the scientists. But what are the facts in the case? What are the functions of the worker? A worker may lay eggs which may produce bees (male). Workers in a body may, by a sort of incubation, hatch eggs. Workers may secrete milk, so to speak, and are able to (one might say) suckle the young. The workers do not only secrete the milk, but milk themselves for the benefit of the young, if I may be allowed to express the process in these words. These are the most prominent faculties the workers possess.

No doubt Mr. Hasty considers the queen a perfect female. Indeed, the queen has become the proud owner of this distinguished title, "perfect female of the hive;" but is she justified in holding it? What qualities do we generally look for in a perfect female? Mr. Hasty is growing up a young bovine, a heifer calf, by the name of Dinah. The mother cow did not only give birth to this calf, but she provides for it proper food, and suckles it. So the here well-defined characteristics of this perfect female cow are, 1, to give birth; 2, to furnish food by secretion. The queen can well perform the first of the two; but further she can do nothing to keep her race from becoming extinct; the worker must come to the rescue; the worker performs the other half of the work of the true female. If I am not very much mistaken, then the worker has a right to the name "female," perhaps fully as much as the queen; but, as it appears, neither one is a perfect female; the two together make the ring complete; and since the one carries the pronoun *she* undisputedly, the other might as well. When the time comes that the relative missions of queen and worker are not only fully understood, but to each the credit given that to each belongs, then we shall hear no more of the queen being the only perfectly developed female, and the worker being neuter, but each will be addressed as it properly should — Mrs. Queen and Mrs. Worker.

Naples, N. Y., Jan. 3.

HE, SHE, OR IT.

A Little Advice to the Editor.

They are having a good deal of discussion in GLEANINGS about the proper pronoun to use in connection with a worker-bee, and the editor says in a note that he has associated with *he* smartness and wickedness, and with *she* softness and goodness. Here is just where the trouble lies. Man, the male, has always egotistically assumed that *he* was the superior of the rest of creation, women included, and the world has been run with the *he*, *he* idea uppermost, until *he* has left *she* out of almost every thing. This was especially true in Bible times. Did it ever occur to these male egotists that it is the female germ which is first in the order of creation? In nature it is the male cell that parts with its individuality when a new being is introduced into this time world. Whatever custom and tradition may say, "man is born of woman," according to nature, and this places woman first. Man smarter than a woman? Not much! We have seen women who could peel the bark off a hickory

sapling, the equal of any male gender. Better continue to say *she*, young man, when you speak of a worker-bee; this is the age of "woman's rights," and you may wish you had if you do not. *She* is not so "soft and good" as she might be when you get her aroused; for illustration, a *she*, *it*, or *him*, which shall I say?—bee, a neuter, if you please. —*The Modern Farmer and Bee-keeper, by E. T. Abbott.*

TRAVEL-STAIN.

The Whole Question Reviewed and Restated; Getting the Game Holed, and then Digging it Out; a Valuable Article.

BY J. E. CRANE.

In GLEANINGS for Feb. 1 Dr. Miller says, "J. E. Crane's article, page 42, is entirely correct; but it only shifts the question one step farther back — is the black carried up from the brood-nest into the super caused by travel-stain, or what is it?" to which the editor adds, "I do not believe we can tell where the black does come from — perhaps sometimes from out of the hives; but I suppose that, in the majority of cases, it is chunks of propolis."

Now, then, let us see if we have got our game "holed," as the hunters say, before we proceed to dig it out. But first let us take a short lesson in colors.

I suppose we are all familiar with what is said of the diamond and lampblack—both the same chemically, yet one the purest white while the other is the purest black. Whence the difference? Just a little different arrangement of particles, we are told.

Take another illustration. The egg from which a honey-bee is hatched looks like a minute elongated pearl. With the heat of the hive it soon hatches, and is fed by nurse-bees a white substance like milk, and in a few days it becomes a large larva nearly white, when it is sealed up; and in a few days more, if we remove the cappings, we shall find a nearly mature bee almost as white as snow. A little later it may emerge from the cell as gray in color, and, after a few flights, its body is black, softened by a light-colored fuzz or numerous short hairs. Where did it get its color? Is it travel-stain? I think not.

I have introduced these illustrations to show how slight a change is required to change color, but hardly need them to prove the origin of the so-called "travel-stain," for the color is not black, but rather a reddish brown, or cinnamon, and evidently comes from some substance or substances of the same or similar color.

There are three or four sources from which it is derived, and it may be, in exceptional instances, more; viz., pollen, propolis, cocoons of young bees, and all of these mixed.

Pollen varies in color with the flowers from which it is gathered. It is often nearly white, and again a light yellow or dark yellow, or orange or pink, or red or brown, or it may be some shade of green.

What is propolis? I look in my Standard Dictionary and find that it is "bee-glue." Good! Some of us have been aware of that for some time. But what is bee-glue? It may be one of a dozen different things, or all combined, which the bees gather to stop up cracks and crevices, or smear or coat the inside of their hives, daub the inside of sections, or even the surplus combs or the brood-combs, or even for capping. This very afternoon a neighbor brought me some section honey to show me, and wondered if I could tell him what it was that made his combs look so colored, while the honey was white. I told him the combs were built late in the season, and propolis used in capping.

"Yes," he said, "they were built late;" and when I gave him a glass to look through he could see nothing but propolis to discolor his combs.

I believe all the coniferous trees furnish propolis in varying quantities and quality. I have found of late the butternut furnishes a good deal of a dark brown color. The northern poplars have long been noted for the production of this substance; but there is one variety, *Populus balsamifera*, that is the abomination of bee-keepers, so abundantly does it produce bee-glue. But bees gather it also from old bee-hives, or from slumgum that some careless neighbor has thrown out, or it may be from that thrown out of some hive by the bees, or perhaps they may get a full supply from the newly grafted orchard of my neighbor across the way, and be grafting wax with a little dirt. Now I believe we have ample evidence that our game is in its hole. Let us see if we can dig it out.

If we take a new colony with new combs we shall find the combs a pure white. The first intimation of color is in some cells partly filled with pollen. Later we shall find that every cell from which a young bee has emerged has lost its snowy whiteness. Indeed, we can tell every cell used for this purpose if even only one bee has hatched in it. The brown cocoon is left, and gives its color. Every succeeding bee that comes out leaves the cell darker until, in old combs, they look almost black.

But there are other processes going on that change slowly, perhaps, but surely, the color of the comb. Every cell in which pollen has been stored is likely to be changed in color, not the same as where brood was reared, but changed. The whiteness of virgin wax is gone, and in the place of it a dull yellow or brown. As honey becomes scarce the latter part of the season, and the bees cease to make wax, they will gather propolis and stick it about the mouth of cells, and perhaps give the lower edge of the comb a good coating of it also.

The following winter the bees gnaw down the combs more or less, and in spring gnaw out cells of pollen that may be coated with mold, or some of the combs that may also be colored with mold.

If the colony is strong, these chippings are picked up, mixed more or less, and used again to build comb or cap brood, and these

processes go on year after year, producing accumulations after a time that are a surprise when one attempts to "make beeswax," and finds but little more wax, or at least is unable to separate little more, than he would from a wasp's nest, but in its place slumgum.

Now, that bees are capable of shifting these accumulations, or a part of them, with more or less wax from one part of the hive to another, or from the brood-chamber to the super, is evident if we take a comb from a populous hive with old combs, in spring, while honey is scarce, and replace with an empty frame. We shall soon have a new comb in the place of the one removed; but how different from one made of virgin wax! In color we are at once reminded of "travel-stain," for the color is almost identical with that of the so-called travel-stain in boxes of surplus honey. It would be absurd to say that the bees had built this comb out of travel-stain, or even to suppose that they had built it of virgin wax, and changed its color so quickly by traveling over it, for the whole character and texture are different.

It seems evident that both pollen and propolis have become mixed with the wax and cocoons of old combs in a way to give them their dark color; and when wax is scarce they will be thinned down, and the extra used either in building new comb in the brood-chamber or when mingled with new wax used for finishing new combs in surplus boxes. Of course this is not always the case, for the color of the cappings may come from propolis alone, or, as is sometimes the case, from freshly gathered pollen.

It is not surprising that some should think it may come from the clustering of young bees on new comb, as suggested by Mr. Comeau, of Henryville, Quebec, as combs are likely to be stained most when young bees are hatching rapidly while but few larvæ are being sealed up; but this theory is contradicted by the fact that we often find our combs colored as fast as sealed — in fact, sealed with colored wax.

And now to recapitulate, I believe it may be safely stated:

1. That stained combs come sometimes, though rarely in this section, from pollen carried into the hives on the bodies of bees, which for some reason they have not made into pellets, as may be proved by examining the pollen and the stained combs.

2. By the use of freshly gathered propolis, or of minute particles of propolis gathered from the body of the hive or elsewhere, and mingled with cappings, and is very common, as may be proved by examining the cappings through a glass, or melting up a large quantity and observing the propolis that will separate.

3. The most frequent cause, perhaps, in this section, is the use, in capping of surplus combs, of impure wax from the brood-chamber, caused by the mingling with it of propolis, pollen, the cocoons of young bees, and, under some circumstances, it may be the excrements of worms or bees, or moldy combs, and often used first in the capping of brood, and, later, in the super.

[As this article is quite in line with the investigations of Cheshire, and quite agrees with some of the experiments of some of our best men, I think we may safely set it down that most of the propositions above elucidated are fairly well proven.—ED.]

CUBA.

Its Drawbacks, Troubles, and Privations; Fevers; Wax-moth; Fleas; Reptiles, etc.; a Very Interesting and Readable Article.

BY W. W. SOMERFORD.

"As I am anxious to learn all about Cuba in the way of honey-production" is a fair sample of the letters that are dropping in from prominent bee-men. I now have two before me from Mr. F. Danzenbaker, of hive fame, and also 20 winters' experience in Florida, with bees and oranges; and for a practical questioner he minutely fills the bill, and especially asks for "drawbacks," troubles, and "privations."

1. Is there danger from banditti?

There is not at present any danger from banditti, and never has been, except for the *very* rich man; and as bee-keepers don't class that way down in my country, I think a person can, as a general rule, if he chooses, sleep with his doors and windows open, except during the rainy season; then it's best to keep them shut, to keep out dampness, the chief cause of sickness in Cuba, and the only drawback to the bees to keep them from booming the year round. The rainy season, though, lasts generally three months, and rain, some *raw*, does not skip a day, during the 90 days. Then the bee-keeper has his patience tried, for some of his bees won't work in the rain, *especially if black;* and if he does not feed starvation is the result, though I have never yet seen or heard of a hive of Italians starving in Cuba during the rainiest times—times when it rained so much and so incessantly that every thing was soaked with dampness, so that bound books, even, were coated over with green mold in a non-leaky house, while grass grew green and tassled on top of the house.

2. Malaria, fevers, etc.

Cuba is not a malarious country. Moss does not even grow there on trees, as it does here south with us; and the verdict of the American population who have remained in Cuba for years is that it is healthy. It can not be otherwise, swept as it is by sea breezes almost continually, being so narrow.

3. Wax-moths, etc.

They are plentiful the year round, but they give the modern bee-keeper no more trouble in Cuba than here south, except in comb honey, and that should be shipped north before March, as the crop is harvested by that time. The moths come in November, December, January, and February, December and January being the best months for honey.

4. How is honey kept from getting thin?

The extracted honey is nearly always sold in February or March, before rain sets in.

5. What kind of poisonous reptiles lurk around the apiary?

No reptiles in Cuba that are poisonous that I know of, except water-moccasins; but they lurk only around ponds, or in the creeks, so they never bother in an apiary.

6. Are fleas bad?

I never saw the like anywhere—thousands of them. I have known natives to sleep entirely *nude*, to keep from carrying fleas to bed with them.

7. How many kinds of fleas?

Only one kind—the numerous kind.

8. Can they be escaped?

I have tried, and seen others try to escape them. I have even tried diluted phenol or carbolic acid, but to no avail. They wouldn't stay off a fellow.

9. Any ticks, chigoes (jiggers), or bedbugs?

No ticks, no bedbugs—no beds for them to stay in; cots are in common use in place of beds; but jiggers are numerous in some places —the kind that burrow into one's feet around the toe-nails, and cripple them up, especially when socks are not worn (native style), or "sockless Jerry" style; no red bugs of the southern type, that crawl all over a fellow and set him afire.

10. How about sand-flies and gnats?

We don't have sand-flies in Cuba—no sand on the island; but gnats are innumerable.

11. Do mosquito-bats or dragon-flies prey on the bees in Cuba? They ruin them at Miami, Fla., and no way to avoid them.

There can not be any in Cuba, as I have never known them to do any damage to bees, nor have I ever heard any complaint of them; and as I knew of a bee-keeper in Cuba increasing from 25 to 500 in one season I presume bees are not at all preyed upon by insects other than ants. Little black ants are very numerous at times, especially during the rainy season, and often cause weak colonies or nuclei to swarm out, as at that time they are easily discouraged, and often come out, leaving brood in as many as three frames, and well supplied with honey.

I see an article on page 124, Feb. 15th GLEANINGS, saying that Japanese bees work in the rain, and it might be that they are the bees for Cuba, especially during the rainy season. I should like to try them, anyway; for with blacks or Italians it is almost absolutely necessary to have sheds for the bees in order to carry them nicely through the wet months. Dr. Vieta, of Cienfuegos, Fred Somerford, and Fred Craycraft, of Havana Province, three of the most experienced bee-men in Cuba, say that sheds more than pay for themselves; besides, oh how delightful it is handling bees under sheds, no matter if it is raining three times a day for three months at a time! If a chap keeps dry he will feel all right, and sheds made with pole framing, and covered with palm leaves, last for five or ten years; besides, they are very cheap.

12. Do grapes grow well in Cuba?

Grapes and figs do splendidly—seem to be entirely at home in Cuba; and oranges—oh my! how they grow without even a particle of fertilizing! and vegetables such as onions, cabbage, tomatoes, and turnips, astonish one in the way of attaining size without the soil being fertilized a particle. But the *comb* honey from Cuba will in the future be the astonishing feature to the bee-keeper is my prediction.

Navasota, Texas, Feb. 23.

[So Cuba, then, is not a malaria-infested country, as we had been led to believe, from the fact that so many of our soldiers sickened and died there; but the fact that some of the best of Uncle Sam's men died of fevers in northern camps of the United States goes to show that Cuba ought not to be misjudged by the experience of the army. The Queen of the Antilles perhaps, then, is not nearly as bad as the headings above would seem to indicate.

As this article has proved to be so interesting and valuable, I hope friend Danzenbaker will fire another set of questions at Mr. Somerford. We are all anxious to know about that bee country that may some day be a serious competitor to the bee-keeping interests of the United States. I suspect that most of us do not want to believe that Cuban honey can compete with American. But if it can, the sooner we *know* it the better for us.—ED.]

BEE-KEEPING IN CUBA.

A New Field for the American Bee-keeper.

BY A. W. OSBURN'S SON.

It is but natural that all eyes should be turned toward the recent fields of conquest. We are all on the alert for an opportunity to swell our pocket-books. Cuba is known to be a great honey-producing country, from our large reports in former years; hence the unusually large inquiry at present on the subject. No doubt the bee-keeping world has often wondered where the writer of former days, A. W. Osburn, had gone to. He has been called home by the Master, leaving a son and daughter to mourn his loss. Out of deference to an indulgent father we have been living a very secluded life for the last two years; but as time heals, in a measure, the deepest wounds, so it is healing ours slowly, and probably the bee-world from now on will read from time to time sketches from the same old pen, but used by a much less gifted hand.

The American people are subject to what we might call "ambitious finers." Moreover, it is of a peculiar kind that is very contagious. Some absent-minded one sniffs the air, then runs and tells his neighbor that he has smelled gold, and knows where it is to be found. Then his neighbor tells his wife, and that is all that is necessary. Within twenty-four hours the whole neighborhood knows it and is packing up ready to start for the new eldorado. The recent Klondike stampede affords a good example of what I refer to. Thousands have starved to death, thousands more have gone down to a premature grave, and rest upon the fleecy bosom of some far-off and unknown Klondike mountain. So, to avoid any thing of this kind, let the wise man think

twice before he leaps across the stream and finds himself in a strange land which the devastating hand of war has tried to destroy; but the experienced resident knows that fire can go only surface deep. So it is with a view to shielding the bee-men, or at least those of them who expect to go to Cuba and pick up gold, that I have decided to write a little on the subject, hoping that, after they have read what I have to say on the subject, they will be able to decide which is best, for I shall set forth things just as they are, and not write for deception in order to further my interests.

First of all, the question is asked, Is there any money to be made by keeping bees in Cuba? I reply, yes, most assuredly there is—more, in fact, than in any other country I know of. Then, again, a thoughtless fellow asks, "Is it much work to manage bees there? I shouldn't think it would be, for you have no wintering to bother with." Well, I suppose he knows how many days there are in a year. If so, he knows just how many days' work he has got to do in a year in order to raise a *crop* of honey in Cuba. To all those who have the foolish idea in their heads that they can come to Cuba, and from 75 or 100 colonies take honey enough in a season or two to make them rich, I would say, drop that idea at once, and stay at home, for such will only be doomed to disappointment.

There is money to be made by raising honey here; but remember there is never a rose without a thorn. The larger the crop you raise, the more work you have. There is no season of rest for the bee-keeper in Cuba. The tropical sun shines and the flowers bloom the year round. Commencing with the first of March you have your young queens to raise as soon and as fast as you can. If your apiary contains 500 or 600 colonies, you have to raise 125 or 150 queens, get them to laying, and built up as soon as possible. By the first of May swarming is in full blast, and you will have no time to take a nap between swarms. Then between the first of May and the first of September the busy little moth will furnish you with ample employment, digging him loose from the corners of the hive and comb from Sept. 1 till Nov. 1, or sometimes the 10th. Feeding and preparing for the harvest will keep you on the jump till the first of April. Then you have got to step around as if you had coals of fire in your shoe; for when the weather is warm, and your 500 or 600 colonies get limbered up, if they are in ordinarily good trim they will bring honey in at the rate of from 2500 to 3000 lbs. a day; and if two men are going to handle this amount of honey every day for a month at a time they have got to get a move on them, and have a good backbone, especially if they throw it out by hand.

So the stranger can see by these few notes that there is no fun attached to bee-keeping in Cuba unless it is when he is making $125 a day as we did several times.

In my next letter I will describe some of the many drawbacks in Cuba; how to proceed to establish one of these large apiaries, and about what to expect the first year.

LATEST DEVELOPMENTS IN WEED FOUNDATION.

The R. L. Taylor Experiments; Wax in the Walls and Not in the Base, a Desideratum.

BY E. B. WEED.

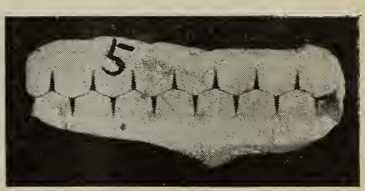
In the years 1893-'94 Hon. R. L. Taylor made some very interesting experiments with foundation, and published the results in the *Review* of December, 1893, and September and October, 1894. His object was to compare pressed (or Given) foundation, with a thin base and heavy wall, with the various other kinds then on the market.

The first year his experiments were conducted with sections of ordinary width; and although he found that the bees preferred some kinds of foundation to others, he also found that, after the preferred kinds had been drawn to about the thickness of a brood-comb, the bees then turned to the less acceptable foundation, and completed the sections filled with it about as soon as the others.

Mr. Taylor very ingeniously reasoned that if, in the next year's tests, he would use narrower sections, more decided results would be obtained, as the sections built on the preferred foundation would be better filled, and weigh more; so for his tests for 1894 he used sections measuring nine to the foot. This time the results obtained seemed quite decisive. In nearly every instance the Given foundation, weighing about 10 feet to the pound, with most of the wax in the walls, produced much heavier sections. For instance, tested with the Van Deusen, 14⅕ feet to the pound, an equal number of sections weighed 15¼ lbs. as against 9½ lbs. from the Van Deusen.

Mr. Taylor's conclusion was, "Heavy foundation has a decided advantage over light." He also made very careful measurements of the base of the combs built upon the different foundations, and found that, where the 10-ft. Given foundation had very thin bases, the base of the comb built from it was, in many instances, even lighter than natural comb, and very much lighter than any of the seven other kinds tested with it.* The cuts are reproductions of cross-sections of foundation, weighing respectively as many feet to the pound as the numbers indicate.

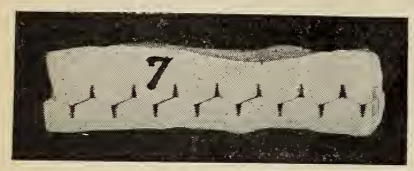
Figs. 5, 7, and 12 were made upon the same plates, with different thicknesses of sheeted



wax. Of course, No. 5 required a heavy pressure to form it, while Nos. 7 and 12 required much less; and if there is any virtue in press-

* See table on p. 295, *Bee-keepers' Review* for 1894.

ing wax lightly they should possess an advantage.



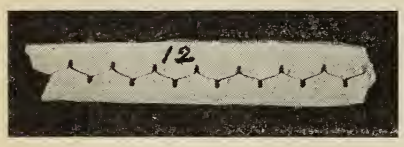
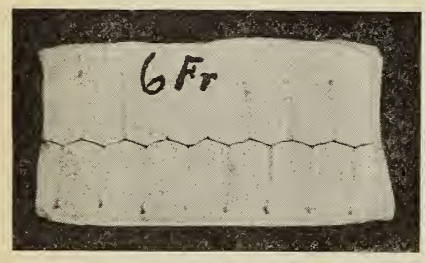


Fig. 6 is foundation from the same plates, 6 feet to the pound, and drawn out by the bees in January of this year.



The cut does not represent the walls fairly, as they are as light as any I have ever measured.

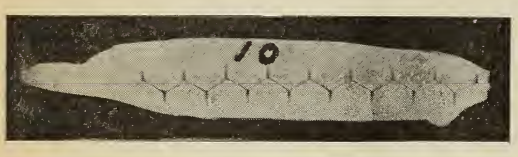
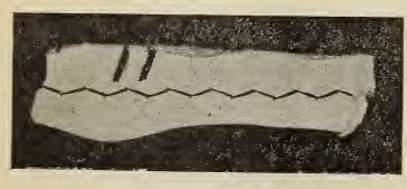


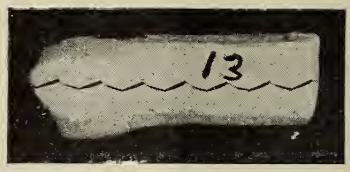
Fig. 10 is a poor illustration of the foundation we are now manufacturing.

Figs. 11 and 13 are regular light and extra light section, from The A. I. Root Co.'s stock.



I do not anticipate that, under *all* circumstances, this new foundation will give better results than the old style; but I am confident that it generally will.

To sum the whole matter up, if the foundation generally in use is perfect, and leaves absolutely nothing to be desired, then the new product and machine have no excuse for being. On the other hand, if the ideal foundation is not yet upon the market, we now have a means of producing it; and no-wall foundation 20 feet to the pound, or a deep-cell foundation of any



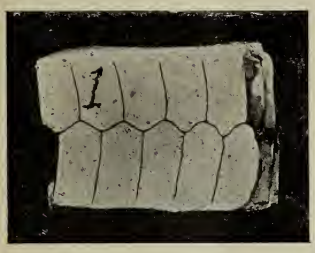
desired weight, are alike practicable I don't know "for sure" just what shape the ideal foundation will take; but when we agree on that point there is no question that it can be made.

[I will explain that the plates above represent cross-sectional views taken from some of the latest samples of foundation made by Weed's new method, and from samples of ordinary foundation on the market. It would be impossible to cut cross-sections of wax without marring the edges. To prevent this, each piece is imbedded in plaster of Paris; then a razor-edged knife slices across the plaster, showing a perfect cross-section of the foundation, just as it leaves the plate. I know of no method that can show more exactly and more truthfully than this one the relative thicknesses of the bases and the walls of the various grades of foundation.

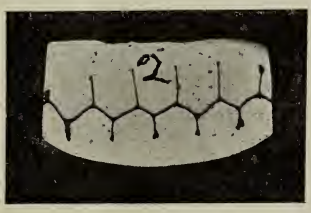
For some time—in fact, ever since Mr. Taylor, of the *Review*, gave the results of his experiments in 1893 and '4 — I have been strongly of the opinion that what was needed was *less* wax in the *base* of our foundation, and *more* in the *walls*. As desirable as this thing seemed to be, it did not seem to be possible with ordinary rolls to put some of the surplus wax from the bases into the walls; and Mr. Taylor's experiments years ago showed that an old Given press, imperfect as it was, would produce a thinner base than rolls. I believe rolls *can* be made to produce thin bases, but they have not hitherto been built. I will say in this connection that a much thinner base can be secured on rolls by using thinner sheeted wax. Mr. Weed was of the opinion that a more perfect foundation could be made with plates. Accordingly, with that theory in mind he has gone ahead and made several sets, all of which were discarded except two. These gave a foundation with a base as thin as the bees make it. I have thought it was thinner, but Mr. Weed says not. It is necessary to have a certain amount of wax to stimulate the bees to comb-building; and that wax, as will be seen by Figs. 5, 7, and 12, is placed in the *walls* and not in the *bases*. The spurs sticking up show sectional views of the walls.

Going on this theory we find that, in nearly every case covering a period of two or three years, this large amount of wax in the wall seems to be thinned down to the thickness of

natural comb. No. 6 Fr. is comb built out from foundation made from plates; and before it was drawn out it looked very much like sample 7. The bees have apparently thickened the bases, because they were too thin at the start. Even now they are no thicker than those shown in 1 and 2, built wholly by the bees. They have made the walls so thin and gauze-like that they almost disappear. In fact, they can just be discerned.



This and former experiments show that we can stick as much wax as we like in the walls, for it will be thinned down; but we must be careful about getting too much in the bases; for while the bees *may* thin it there, they rarely do; and the excess of wax, therefore, in the bases, is simply so much waste product, and who pays for it? The bee-keeper and not the supply-dealer.



Probably the new foundation will not run, for the same superficial surface, any lighter than foundation commonly in use. It is found that, when foundation is too light, the bees either tear it down or else they are very slow to take hold of it. Although we have made extra-thin foundation for years, running about 12 or 13 feet to the pound, the bulk of the trade calls for ordinary thin, running 10 to 11 feet. A customer may order the extra-thin; but in nine cases out of ten, the following year he will order the next heavier grade; but, as I said, the ordinary 10 and 11 foot-to-the-pound surplus foundation now on the market has almost no wall, but a great surplus of wax in the base.

No. 11 is the ordinary thin super, running 11 feet to the pound; and No. 13, extra thin running 13 feet to the pound, and is like what is being turned out on rolls by foundation-makers, including ourselves. If these be drawn out into comb by the bees we shall have the same thick bases as there shown, without any apparent change. For instance, the samples shown in the accompanying figures 15 and 16 show first the foundation and then the comb after the bees have worked it out. It will be observed that in the above case the base is left almost untouched.

The second sample, and last one shown, is brood foundation worked out into comb, and regarding it the same rule holds true as in the case of that designed for the supers. We are indebted to the *Canadian Bee Journal* for these last two engravings. We have other cuts that show these things just as strongly,

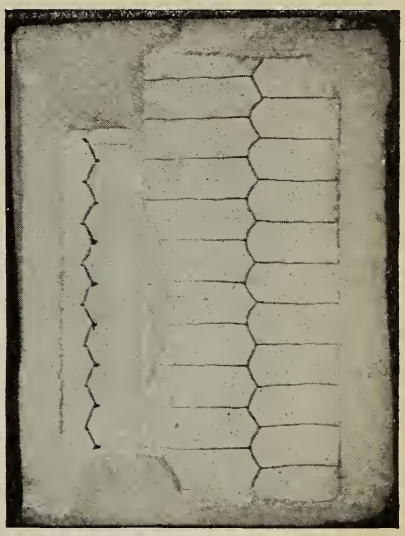


FIG. 15.

and personally I am thoroughly convinced that the foundation of the future should and will have thinner bases.

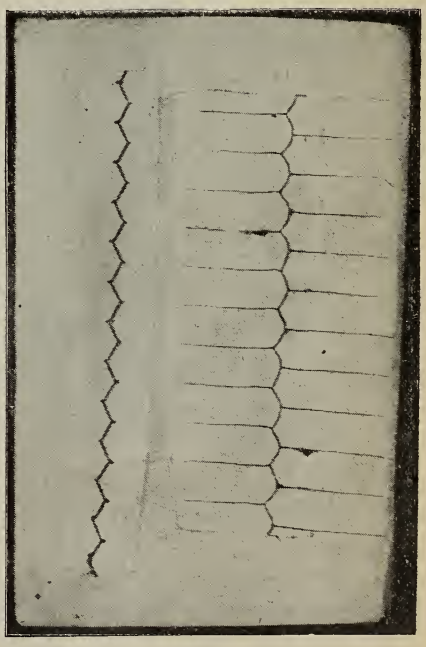


FIG. 16.

Mr. Weed has already made a set of small plates that make the right kind of foundation; and I also told him I thought he could make a set of *rolls* that would make the same article, or nearly that. He is skeptical about it, but

I insisted that he should try it, because there is so much to be gained in the economy of manufacture and consequent reduction in price to the bee-keeper, if rolls can be made to do the work.

As our readers will see, as per announcements elsewhere, we are prepared to furnish limited quantities of this new foundation, which we shall call "Weed's thin base." The sheets are cut and trimmed of a size to just fill a section 4¼; and the whole sheet, including the walls on both sides, is about ¼ inch thick. Sheets run 10 feet to the pound, and I confidently believe they will come the nearest to giving a "no-gob" foundation of any thing that was ever produced. I do not expect we shall be able to produce a better article than that made wholly by the bees; but if we can do as well we shall have reached our goal. In Figs. 1 and 2 I show you samples of natural-built combs, the bases of which you will see are about as heavy as that shown in Fig. 6.

TESTS OF FOUNDATION.

The Extra-thin Carries Off the Palm; an Interesting Series of Experiments.

BY JOHN M. MYERS.

[After I had prepared the matter above, the following came to hand.

The writer of it, instead of preferring ordinary thin, gives his preference to the extra-thin—not because bees take to it any better, but because it makes a better-eating comb honey. But his experiments show that the heavier grades of foundation are preferred by the bees. Now, then, *if* we can give them this same weight in a foundation that *will* give no gob in the comb honey, don't you see we work in harmony with both the bees and the eater? —ED.]

I used medium brood Weed process in the brood-chamber, full sheets, frames wired. I used this year thin and extra thin full sheets and bottom starters in sections. The thin foundation gave combs solidly filled and firmly fastened to the wood all around, and would safely stand shipping around the world. There is more wax in the comb than can be eaten by an expert, and be relished with the honey, which fact condemns it for me and my direct customers.

The extra thin had a severe test, as I left the sections on, week after week, waiting for honey to flow from the abundant bloom of the summer blossoms. But no honey was secreted.

The bees, for pastime, gnawed the corners and trampled down the bottom starter, and, as I thought, made sad havoc with a foundation too delicate for such a season. In many sections the cells were drawn out as far as the little ridge of wax would go, and they were in that condition when at last honey began coming in late in August. Some colonies worked on extra-thin filled sections solid to the wood, with a pophole in one or two corners; but in many sections none at all were left.

One colony of three-banders, worked on a small top starter last year, worked combs fastened at the top only, having a bee-space on two sides and the bottom. This year the same colony had the same fault, and tried to accomplish the same result on full-sheets and bottom starter of extra thin. This queen loses her head in the spring.

I received a small consignment of the deep-cell natural-base drawn foundation and six pieces of double extra-thin, 2 inches by about 3⅞. I made up a super of thin, extra-thin, double extra-thin, and drawn or deep-cell foundation. I placed this super on a strong colony, and examined it every few days. It was late in June, and no honey was gathered until late in August. The bees filled the super with their own busy presence, and worked away at the various samples of assistance. The thin foundation was drawn out into neat shallow cells from top to bottom, and the top and bottom starters joined in many cases. The extra thin was eaten away at the corners, and the cells drawn a little, but not over the entire surface—mostly at or near the top. The double extra-thin foundation was much shorter, and rounded by the time honey came, but shallow cells were formed near the fastening. The cells of the drawn foundation were shortened back, and appeared to be of much the same depth as the cells on the thin or heaviest foundation. The double extra-thin and drawn had no bottom starters, while the thin and extra-thin had bottom starters of their own weight. Each section was marked, and they were mixed as much as possible. Honey started to flow about August 26. I did not note the progress of this super for four or five days; then I found the entire super nearly completed, and I placed another under it. The top one was finished complete, and the bottom one nearly finished, when the flow was over. I found, on examination, that if I had not marked the sections I could not have distinguished the thin and extra-thin by their appearance. The drawn and double extra-thin had the same fault as the lower half—ran into drone comb; but all were solid to the wood all around.

I found in the practical test on the table that the double extra thin was the nicest to eat. No center rib could be noticed in cutting through with a spoon, and honey and wax melted away in the mouth together. This was so of the upper third of the comb only. The two lower thirds, drone comb, was much like comb built on thin foundation. The drawn foundation was more delicate than drone comb —much like extra-thin. Extra-thin foundation could be eaten with pleasure, wax and all, and is so eaten by every one enjoying the hospitality of our table. The thin I can not enjoy, as I have to return cuds of wax to the plate or bone-dish.

Woodcliff, N. J., Nov. 26.

SWEET CLOVER.

Stick to sweet clover I have it growing on my farm. Cows eat it all right, so do sheep, and I kept my horses two weeks on it when mown and fed to them.

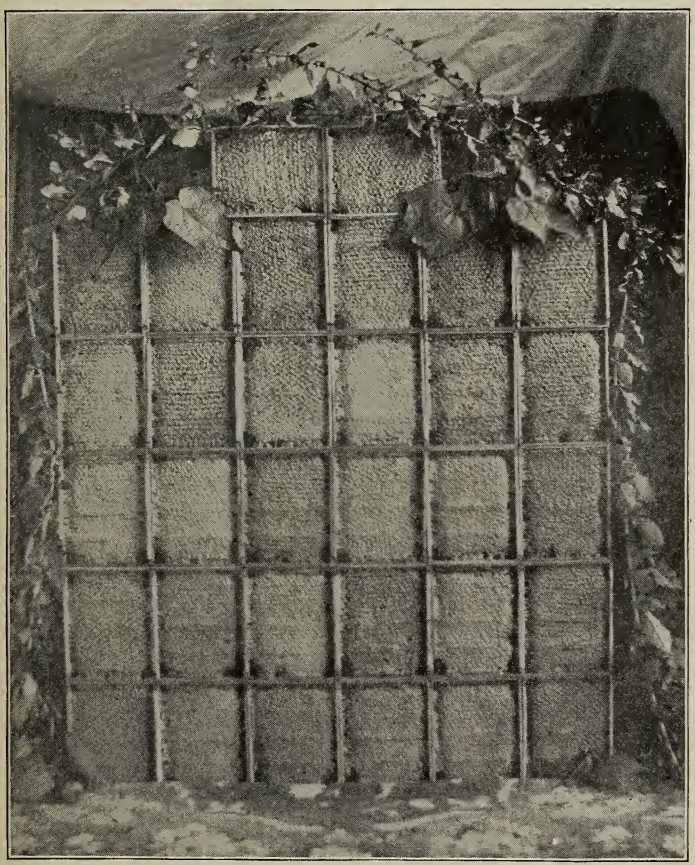
Arthur, Ill. J. T. LEE.

DANZENBAKER'S HONEY.

Was that Shown in the Journals Taken from Selected, or was it the Common Run?

BY F. DANZENBAKER.

Mr. Editor:—A prolific writer for the journals desires to know if the four plain 4x5 section of honey, Fig. 11, p. 920, GLEANINGS, Dec. 15, was raised by myself, or "selects," "from large lots of honey that I might have bought of others." For his information, as well as others', permit me to say they were not selected with a thought of your engraving them, as you know, but to demonstrate whether I could ship safely hundreds of miles by express from Hamilton, N. C., to Medina, O., half a dozen 4x5x1⅜-in. plain sections, in a Danz. shipping-case ⅛ in. thick weighing only 5 oz. The six sections were from the first super taken off. One-half of it was filled with Weed's drawn combs, the rest full sheets of foundation. I believe the four sections shown were the Weed drawn combs, as the bees started in them at once, and they were the first finished.



HONEY IN DANZENBAKER BEEWAY SECTIONS (OLD STYLE).

Mr. C. D. Duvall and myself were working together. We took off the first supers when partly finished, and divided them up to get bait combs for other supers. Finding 16 sections finished, fit to sell, in the first super, I sent six of them to you to show you the *defective* cells at the top of *all* the sections, *caused* by having the top slat of the 1898 fence $\frac{1}{16}$ in. *too high;* also that the cleats and openings between the slats *were correct*, and the fence was just right at the bottom, to have the sections evenly filled out all round to the wood.

In comparison with the four sections shown in Dec. 15th GLEANINGS, p. 920, Fig. 11, I submit a half-tone engraving from a photograph of 32 half-plain 4 x 5 x 7 to the foot Danz. sections, made at one time in a Danz. super (furnished with the 1897 N. fences), by W. W. Lathrop, of Bridgeport, Ct., who is an amateur beekeeper, having bought his first bee-hive in 1897.

He says: "These 32 sections were put on the hive in September, and taken off October 2," and he "had 172 sections of fall honey, all of it just as good." He had only three colonies in the spring.

The entire 32 sections are filled alike at top and bottom, showing that the 1897 fence was the correct width, although irregular spacing from $\frac{3}{16}$ to ⅜ inch caused a slight ridging of a few of the sections. While the 1898 fences were better spaced, and show *no ridges* on the surface of the honey, the top of the fence was $\frac{1}{16}$ inch *too high*, causing a row of open cells at the top of the sections. Happily this can be remedied by dressing off a trifle at the top of those now in use.

These faults have been corrected in the M. fences for 1899, and we believe all that are now going out are as nearly perfect as it is possible to make them. But the bees will tell.

Washington, D. C.

[I am glad to corroborate Mr. Danzenbaker's statement. The honey he refers to, and which was shown in our Dec. 15th issue, page 920, was placed on that page without any comment by myself. It was put in as an after-thought,

after the matter had been placed in type. When the honey was received in the first place, it came in the best of order; but it looked so nice that I had a photo of it taken, and this was half-toned, and the plate lay on my desk several months, perhaps, before it was used.

The honey here shown being made in old-style sections with old-style fences, some two years ago, does not show up as well as some of his later honey; and I would call attention to an obvious defect in it; namely, ridging across its faces. The fences with which this honey was produced were old-style, and the first that Mr. Danzenbaker got out. The slats in these were spaced ⅜ inch apart. We did not then know, as we now do, that closer spacing from $\frac{2}{12}$ to $\frac{3}{16}$ avoids almost entirely this ridging. But we never made any fences for our own hives with spaces wider than $\frac{3}{16}$, and most of them were spaced closer.—ED.]

SPRAYING FRUIT-TREES; HOW AND WHEN.

Where to Get Necessary Information in Regard to Spraying; a Matter of Value to the Fruit-grower and Bee-keeper alike.

J. W. ROUSE.

We notice that Bro. M. N. Simon, of Ohio, has a letter, saying that "the fruit-growers near him spray their fruit-trees while in bloom, thus destroying large numbers of his bees." We will say that the fruit-growers of his neighborhood very much need some missionary work among them for their own especial benfit as well as to help the bee-keepers. While we have no doubt that these fruit-growers are an intelligent people, yet spraying when fruit-trees are in bloom shows ignorance on this subject at least, as all well-informed horticulturists know that it does but very little good to spray while the bloom is out; and to do so destroys large numbers of the fruit-grower's necessary helps to successful growing of fruit. It would be too much in one article to show the necessity of insects (and bees are the best of all of them) to the successful growing of fruit; but what we have to say will be on spraying.

It is fully recognized in Missouri and in the West—in fact, everywhere, so far as we know—that the time to spray must be determined by what the spraying is intended for. If for fungus, it should be done before the tree comes in bloom; and, in some instances, even before the buds get started much. For the codling moth the spraying should be done after the bloom has fallen, as the moth does not deposit her eggs until the fruit is set; so to spray while the bloom is out would be too soon, and the work lost, besides poisoning the fruit-grower's helpers, the insects.

In the Missouri State Horticultural Society's report for 1893, 1895, and 1896, experiences are given as to when to spray; and in no instance is it advised to spray while bloom is out. The writer had the honor of offering a resolution at the meeting of the society at Marciline, Mo., in 1896, being there by request of the secretary to give a lecture on bee-keeping in relation to horticulture. The resolution was: "*Resolved*, That this society strongly advises fruit-growers, in spraying fruit-trees with poisonous insecticides, not to do so while the trees are in bloom, for the reason that at that time it practically does no good, but may be the cause of destroying, by poisoning, large numbers of our helpers in fruit-growing, particularly the honey-bees." This was unanimously adopted. Our horticulturists (many of whom are bee-keepers), recognizing the importance of bees in the successful growing of fruit, have cordial feelings toward bee-keepers; and for the past several years, in almost every one of their annual meetings, they have had either a paper or a bee-keeper to make a talk on bee-keeping. We would advise our readers who may be interested, to send their address to Cornell University, Ithaca, N. Y., and get Bulletin No. 101, entitled "The Spraying of Trees;" also Bulletin No. 86, "Spraying of Orchards;" and to U. S. Department of Agriculture, Washington, D. C., Farmers' Bulletin No. 7, "Spraying Fruits." These are all free. The best of all, that will give the most information as to when to spray and how many times is the Spray Calendar, by E. G. Godeman, issued in Feb., 1895, by Cornell University Agricultural Station. I. P. Roberts is the director. This calendar tells when to spray and what with; and in a long list, in every instance, either before or after the bloom has fallen. If any one wants to spray he should have these bulletins, especially the calendar, as we deem them of much value, being given from practical experience and experiments. We will not give any formulas, as that is another question.

Mexico, Mo.

FOUL BROOD GERMS.

May not Honey Boil in Separate Strata?

BY J. H. MARTIN.

Mr. Editor:—I am going to try to help you out on that proposition about boiling honey for the killing of foul-brood germs. You quote Messrs. Cowan, Taylor, and others as indorsing a ten-minutes' boil. On the other hand, Mr. Buchanan has made a failure at it, and would boil an hour or longer. Now, I can imagine that every one may be right. I will guarantee that Messrs. Cowan, Taylor, and others, boiled only a small amount as compared with Buchanan's 15 or 20 gallons.

Is it not a fact that liquids boil in successive strata? For instance, if there is a small amount of liquid in the bottom of a boiler it will all be thoroughly boiled in a few minutes; but fill the boiler with several gallons, and though it may seem to be boiling furiously there are successive strata, from the hottest at the bottom to the coolest at the top; and while foul-brood germs would be killed in the bottom stratum they would be alive in the upper stratum. It is the hot-air bubbles continuously rising to the surface that eventually give the whole mass of liquid a uniform tempera-

ture. A large amount needs longer boiling; and where Mr. Buchanan made a mistake was in treating his many gallons as other parties had treated a gallon or less. I am sure that, if the proper temperature is gained in ten minutes, the germs will be killed; but to be on the safe side, boil a gallon in a large boiler ten minutes, twenty gallons an hour, fifty gallons three hours.

In the long broad shallow pan used for the evaporation of maple syrup we have an illustration of this law. There are fewer strata to heat than in a deep boiler, and the evaporation is more rapid. If foul-broody honey could be boiled in such a pan it would require no three hours to kill the germs.

Shermanton, Cal.

FOUL-BROOD GERMS.

What do we Mean by "Boiling"? Scientific Exactness.

BY PROF. C. F. HODGE.

Since foul brood has occurred in Worcester, I have naturally been interested in discussions of the subject that have appeared in GLEANINGS. In trying to make definite statements on such important matters, should we not be a little more exact about our fundamental facts? First: What is meant by "boiling"? If by "boiling" we mean putting any shaped vessel on any kind of fire and have it show a little ebolition in a certain spot for fifteen minutes, then surely "boiling for fifteen or forty-five minutes" may be insufficient to kill the germs. Stir such a vessel gently but thoroughly, and note how long it is before it begins to boil again. Where thorough boiling must be insured we must either stir the liquid continuously to heat all parts uniformly, or heat equally from all sides, as is done in steam sterilizers. "Dead spots," which have not been heated up to 212, may remain very much alive as to germs, and reinfect the whole mass. Of course, allowance must also be made for altitude above sea-level. This makes several degrees difference whether you boil on the coast or in the mountains; and these differences, when it comes to killing microbes, are apt to prove like the proverbial "inches" added to or subtracted from a man's nose.

A second fundamental is the condition of your bacilli when boiled. It is well known that, in the spore state, it is hard to kill many kinds of bacilli by boiling. It may be represented by the difference between killing a plant and a seed by boiling. The practice in laboratories is thus to boil, say, for fifteen minutes, twice or even three times on successive days. Boiling the first time kills all the growing bacilli, and starts the spores to sprouting. By the next day they have not had time to germinate and form spores again, so that the second boiling kills every thing that has started, generally every thing in the liquid. But since some of the spores are slower than others in germinating, and to make assurance doubly sure, it is the common practice in bacteriological laboratories to boil for a few minutes on three successive days. Since *Bacillus alvei* does form spores, the most rigorous treatment should be adopted; and until the resistance to boiling of the spores of *Bacillus alvei* has been more accurately determined than at present, I would not risk any thing short of boiling for fifteen minutes, with thorough stirring, on three successive days.

I should like to know where foul brood comes from, apart from infected hives. Is there not some *wi'd* insect or plant source?

Worcester, Mass, Jan. 27.

[Both of these communications—the one by J. H. Martin and the other by Prof. Hodge—go to show how a few minutes' boiling might not kill the spores of foul brood. It is well known that, when thicker liquids are boiled, the ebullition is apt to be confined to some particular spot; and to keep it from burning, frequent stirring is necessary. I well remember how my grandfather used to boil down sap into maple syrup, and how it used to be my job to stand with a stick and stir, and keep stirring, so the syrup would not burn.

I have just been consulting an article by Thos. Wm. Cowan, who, in speaking of spores, says:

> The spores also possess the power of enduring adverse influences of various kinds without injury to their vitality, so far as germinating is concerned, even if subjected to influences fatal to bacilli themselves. The latter are destroyed at the temperature of boiling water, while the spore apparently suffers no damage at that temperature.

This is quite in line with what is said by Prof. Hodge above. Mr. Taylor, it seems to me, does not consider that to kill *spores* is much more difficult than to kill the actual growing germ life itself. As long as there is room for doubt, one takes upon himself a grave responsibility when he says that a few minutes' boiling of infected honey is sufficient to sterilize it; and I have shown elsewhere that the boiling-point of honey is not so very much higher than that of water. Until we *know* more about the question of resistance of spores to acids or to heat, I for one will not recommend any one to boil honey less than three hours.—ED.]

BACILLUS ALVEI.

Bad Advice; the Importance of Making Sure Whether One has Foul Brood or Not.

BY W. A. H. GILSTRAP.

In 1897 my attention was called to an apiary near Fresno, which was diseased. The owner of the bees, Mr. Andrew Jackson, said it was what Root's A B C book calls foul brood, although Prof. ———, one of the leading entomologists of the country, had said that it was not foul brood; and Mr. ———, one of the recognized authorities on bees in this valley, had told Mr. Jackson that "bees run to extracted honey in this warm climate will get well of foul brood of their own accord." This is the way it looked June 1st.

A lot of empty hives in the honey-house looked as if they had seen service, and I asked Mr. Jackson about them.

"Oh, yes! these all had bees in when this foul brood made its appearance. Had I known what was the matter at first I should have had 300 colonies by this time."

"You had about 85 colonies, didn't you?"

"Yes; about 100 at one time."

"When did you discover they had foul brood?"

"In 1893 I saw there was something wrong. Prof. ——— said it was not foul brood. Then Mr. ——— said foul brood could not live in this climate when the honey is extracted, so I was ruined before I knew the real cause. Let's go out to the apiary."

The first hive opened had a dark-brown sediment deposited on the alighting-board. The bees seemed to have suffered greater mortality than the brood. The few remaining bees seemed to be in fair spirits. Eggs were being laid in very irregular order. Perhaps one-tenth of the brood had pin-holes, sometimes near the center of the cell, and sometimes near the edge, of various forms and sizes; but the term pin-hole would describe them as well as any name, perhaps. The contents ranged from yellow to black, and had the usual ropy consistency. A few cells had fine coffee-grounds (spores). Some cells in all stages were without perforations.

Of the 31 colonies there, 17 were condemned early in August by the newly appointed Inspector of apiaries. Late in September the bees were in about the same condition, apparently, except that fewer diseased larvæ were visible. Perhaps it was because the malady was generally in the spore state, and the spores were covered with honey.

So much blundering, and more that I might mention, has convinced me that, to *know* of the presence of foul brood, it is far safer to see the offending organisms with a microscope. I am convinced that, in our dry climate, the odor is not nearly so pronounced as elsewhere.

How many times must a glass magnify to reveal *Bacillus alvei?* In reply to the above, a celebrated scientist and apiarist said a one-fourth objective would do if the brood was stained. Having something definite, my next move was to ask an enterprising optician the price of such an instrument. He explained that an objective was part of a microscope, as tugs are of harness; but he could not tell me what was needed, and referred me to a local scientist with a $2000 library, who referred me back to the optician.

Mr. Cowan could certainly tell; but I would about as soon go to bed without supper as to ask him. Cheshire discovered the spores with a 500-diameter magnifier; but the catalogs don't say how many times their glasses magnify. The Rootville folks certainly "don't know" or they would say so in their catalog, giving price and general description, otherwise I would ask them.

Many people still believe that a dry climate and honey-extractor are the only medicines needed to cure *Bacillus alvei*. Mr. Jackson is not in that list. As the disorder is not stamped out yet, some others may take his view.

Grayson, Cal., Jan. 11.

[I wish you had told the name of the professor who gave that bad advice. As it now stands, one would infer that it is our own Prof. Cook, and I can not believe that he would be so careless or so mistaken as to say that one did not have foul brood in his apiary when he did. My advice, when samples have been submitted to me, has been this: If I am doubtful, I recommend treatment for foul brood just the same as if I were sure it was the real disease.

I can not think it is necessary to have a microscope to determine whether one has foul brood or not. A person who is inexperienced in handling such an instrument would be more likely to make an incorrect diagnosis than if he trusted to his simple unaided eye or nose.

With regard to microscopes, I might say that I am not without some experience. I used one so much that I fear that is one reason why I have to wear glasses now. In fact, I spent so much time with my microscope that I almost neglected my regular school studies; but at that time the appearance of foul brood was hardly known under the microscope; and although I have since seen it, I would not, with all the experience I have had, be prepared to say that I could surely identify it if I saw it under the field of the objective.

Speaking about microscopes, one can hardly get a good one short of forty or fifty dollars —one that would be suitable for looking at foul-brood germs. I have the impression that a ¼ objective may be used, but a $\frac{1}{12}$ lens I think would be better. A good objective might cost $25 or $30; and from that on one can go as high as he has a mind to pay. Unless one has spent years in the study of the minute forms of life, he had better let the microscope alone. But let me tell you I never enjoyed any study more than that of microscopy.—ED.]

RAMBLE 163.

Two is Company, Three is None; How Bill Greene was Quite Undone.

BY RAMBLER.

As I wheeled along to Medford I was favorably impressed with this portion of Oregon. It is a fine dairy country. The well-built nicely painted farmhouses, the large barns, the contour of the country, and the herds of dairy cattle feeding on a thousand hills, reminded me strongly of my native New York State. If we could drop a portion of this (Jackson) county down in a dairy section in New York, and remove a like chunk from New York for the time being, the people would hardly know the difference. It seemed to me that the people were committing a very unreasonable and wicked thing to complain as they did of hard times. While in Southern California the dry season had all things in its grip, and there was some reason

for complaint, here there was plenty of moisture and prosperity, the people were well clothed, appeared cheerful, and were happily going to and returning from town in their fine chaises.

Along with the occasional vehicle I met what appeared in the distance to be an emigrant wagon, or one of those large wagons with a white canvas cover, or what used to be white, for its pristine whiteness was now grimed with the dust of much travel. While I was not giving much attention to it, but more anxious to guide my own vehicle past it in the sand, what was my astonishment to have the occupant shout, "Hello there, Rambler!"

I dropped off my wheel as if I'd been shot. "Well, well! Bill Greene, as I live!" I exclaimed; "where in under the sun have you been? How did you get here, any way?"

"Why, don't you see? Two good cayuses and a wagon. You see I am doing a little rambling as well as yourself."

Mr. Greene had formerly been a bee-keeper in Southern California. Not being satisfied with that portion of the country he had been shifting from one locality to another; and, still evidently not satisfied, he was now on his way south to spend his winter in some portion of California.

Mr. Greene was a natural born trader, and had picked up quite a number of cases of honey somewhere in his travels, and was peddling it as he passed through the country, or, as he remarked, "supplying the home demand." When I first became acquainted with Mr. Greene he was a happy bachelor living in a tent not far from his apiary; and though he was always gentlemanly and respectful in language and demeanor toward the fair sex, he was so outspoken and firm respecting married life that I always considered him an out-and-out orthodox hard-shell bachelor.

"Well," said I, "Bill Greene, what a pity we are traveling in opposite directions. If we bachelors could travel together we might have more enjoyment out of the country."

"That is so," said he, in an abstracted way. "But, Rambler, you had better return with us." (When he said *us* I thought he meant himself and horses.)

"No, Bill, I can't do that. I am bound for Seattle."

"But, Mr. Rambler, you are going into a rainy country. I venture it is raining like fury there now."

"Can't help it, Bill; I'm going to Seattle, if it rains pitchforks."

"But think of the mud, Mr. Rambler, and you with a wheel."

"Hang the mud, Bill; I'll go to Seattle if it is knee-deep."

"But think again, Mr. Rambler; you will have to pass through Portland, and the city is full of all sorts of unmarried ladies."

"My dear Bill, you worry me; but I'm going to Seattle, if I have to spoil ten miles of apron-strings. And now as you have been so kind as to warn me I will try to return the compliment. When you get to Klamathon you must beware of an unmarried woman there. She is a spiritualist, and is looking out for her affinity; and the trouble is, Bill, whenever a handsome man like you or me comes along she tries to bamboozle him into being her affinity. Now, Bill, don't you be bamboozled, don't get tangled up in apron-strings. You see, Bill, there is danger of getting unequally yoked, as the Bible says, and then it will be see-saw see-saw all the rest of your life, and you will be very unhappy."

While I was making these advisory remarks

there was a little agitation behind that cover of the emigrant wagon. I looked inquiringly at Bill. "Got a dog?" said I.

"No dog; but the solid fact is, Mr. Rambler, I'm married."

"Great Scott!" said I; and before I could catch a second breath he turned back the wagon-cover, and, with hat off, a polite bow, and a blush, said, "Allow me to introduce you to my wife, Mrs. Bill Greene."

Somehow I didn't know just what to do, so I rammed my hands into my pockets, and again shouted, "Great Scott!"

Mrs. Greene didn't seem to be much impressed with my presence. I thought she looked a little sour. My well-meant advice to Bill didn't seem to fit her case, and I readily saw that I was in the disagreeable position where two is company and three a crowd. Bill and I made a few ineffectual efforts to continue the conversation. I looked him serenely in the eye, and said, "Captured?"

"Captured!" said he.

"Portland?" asked I.

"Portland," replied he.

I mounted my wheel; and as I glided away from that emigrant wagon I heard a feminine voice say, "Bill, that chap is just as liable to meet his Waterloo as you were."

As I journeyed along I moralized over the fact that man is of few days and full of trouble, and not the least of these is the danger of being captured.

My wheel fairly groaned under my kicks that afternoon, and I brought up in good order at Gold Hill, ahead of the train, and, wishing to make a big leap out of that country. I boarded the train for Roseburg, over 100 miles distant.

I was let loose in this town about midnight, and thought it would be the proper caper to stop over Sunday. I was fortunate again to stumble into a nice temperance hotel. It was not run on the alarm-clock plan, for there was a young man in the office ready to receive me. In the morning I learned that the proprietor had recently moved from a ranch to the hotel, and had kept bees in a humble way; but his knowledge of the industry embraced only two things — the hatred of stings and the love of honey. His helpmeet seemed to be better posted on the habits of the bee, but her knowledge in that line was not especially brilliant.

That Sunday morning we had hot cakes and honey. The latter was a mashed up mess, and looked as though comb honey dark with travel-stain had been run through a sausage-machine. I asked the lady if that was some of their own product.

"Oh, no!" said she; "that was brought in the other day from the town of Looking Glass, by Mr. Stricklan, one of our leading bee-keepers."

The lady gave me the names of several bee-keepers, but they were nearly all living out in other towns, some ten miles or more away. This would have been only a nice little turn on the wheel on Monday morning; but as luck would have it the rain commenced to fall early Sunday, and kept it up more or less all day. The roads were soon in good navi-

gable shape for rubber boots; but, alas! it was good-by wheeling.

This storm disturbance disarranged my plans for side trips. It was my solemn intention, after viewing the Looking Glass country, and visiting Mr. Stricklan and his honey-pulverizer, to wheel down toward Coos Bay, in Coos County. Empire City, in this county, is a shipping-point for a considerable area of back country, and is recommended as a desirable country in which to locate apiaries. The county contains 1000 square miles, and about half of the area is still in timber; but that portion opened up to cultivation is of marvelous richness. It is a fine fruit and dairy country, and white clover grows here in profusion. The agricultural resources of the county not being fully developed, the bee-keepiug business is in the same condition, and bees are kept in a small way, and as a side issue. Any person making a business of honey-production, and near enough to the coast to secure low transportation rates by water, would no doubt reap an abundant reward.

I find in all of this northern country an entirely different order of things from what it has been in Southern California. In the latter place honey-production is a profitable business in the absence of settlement and cultivation; in fact, the wilder the country the better the pasturage. In Oregon, settlement and cultivation have to precede honey-production. There are portions of Oregon where the forests of pine, cedar, and fir are so extensive and dense that the busy bee would scarcely find a drop of nectar. There are other portions where manzanita and other honey-producing shrubs and trees are abundant; but for a profitable venture in the honey business we must follow the civilizing plow and the dairy. Milk and honey must go hand in hand in Oregon, as in ancient times they did in the rich valleys of Palestine.

ANSWERS TO SEASONABLE QUESTIONS BY G. M. DOOLITTLE

RAPID INCREASE.

Question.—The present severe winter will likely deplete many apiaries in the country; and the problem which will confront many bee-keepers this spring will be, how to increase the few remaining colonies as rapidly as possible to the number usually kept. Will you kindly tell us, in GLEANINGS, how you would proceed where one has plenty of empty combs, some of which have honey in them, where an apiary has been reduced down to a few colonies? Will you also turn to page 140 of Feb. 15th GLEANINGS, and, after reading, tell us how the bees are made to remain with the two-frame nuclei, there described, when dividing a colony in that way?

Answer.—Years ago I would have given the plan given by the editor on page 140, as alluded to by the questioner; but the difficulty of making the bees stay where put was always a great drawback to the plan; hence I sought for another. I should like to have Editor Root tell us how *he* makes the bees stay; for with me, unless some precaution were used, all the bees but the very youngest fuzzy ones would go home, leaving the brood nearly destitute of bees, and thus a great loss of brood would result unless the bee-keeper was on hand promptly to return it back to where it came from. If any colony is made queenless long enough before division, so that the queen-cells are nearly "ripe" when the divi-

sion is made, the bees will stay much better, as these cells answer to the mother-queen with such bees; and all but the older, or field-bees, will stay with the mother-queen when she is moved with the frames of brood. But even with ripe cells the most of the old bees will go back home, thus making the nucleus on the old stand three times too strong, while all the rest will be weak. Taking such two-frame nuclei into the cellar for 48 hours at division, and then setting them where they are to stand just at sundown, will help very much toward reconciling them to the new condition of things; or confining them to the hive on the stand they are to occupy the same length of time accomplishes the same thing. But in this case they wear themselves out very fast from their general restlessness, gnawing about the cracks of the hive to get out, etc.; and with either and all of such plans more or less of the bees will go home anyway, or they would persist in so doing with me. If one has an out-apiary three to five miles from home, then he can carry to and from, and do whatever he likes with bees, and they will stay where put, every time, when using any of the division plans. Now for the way I would and *do* work:

I first get out boxes of suitable sizes, according to the size of nuclei I wish, holding from one pound of bees up to six or eight, the latter being a very large swarm. For ordinary nuclei nothing is better than an ordinary 20-section shipping-case, nailed up and leaving off the side strips that hold the glass. On one side of it, where the glass would go, permanently nail on a piece of wire cloth, and for the other side nail a piece of wire cloth the same size as the first, to four strips of suitable length, so these strips surround the wire cloth as a slate-frame does a slate. Now with four small wire nails, one in the middle of each strip, tack this wire-cloth frame to the opposite side of the shipping case or box, when you have what I term a nucleus-box, one side of which can be readily removed at any time with a jack-knife by prying a little so as to loosen the nails. Or this movable side can be hinged on; but I prefer it as above, especially in getting the bees out.

Next get your tinsmith to make you a great big funnel, which should be 18 inches across the top, with the usual slope of side, coming down to a 2½-inch upright, or outlet, which should be about 2½ inches long. If this outlet is much less than 2½ inches in diameter the bees will clog, instead of readily passing down through, when a frame of bees is shaken into the funnel.

Having the funnel made, strike two opposite sides against something, or squeeze together till you have an oval funnel about a foot wide and 22 inches long, in the diameter of the two ways, across the top. This will collect your bees in better, when the frame is shaken, than it would if left in the ordinary funnel shape. Next bore a hole in the top of the nucleus-box which will just let the small or upright part of your funnel down into it, and fix a slide, button, or something of the kind, to cover this hole, when the bees are in and the funnel out. Beside this bore two or three one-inch holes through the top near either end, and with a proper-sized plunger push a suitable-sized piece of wire cloth down into the box so it will hang down inside of the box from two to four inches, when the wire cloth is tacked at the top to make it stationary. These places are for receiving Good or queen candy, granulated honey, or soft A sugar, with a little water poured on it, for feed, should the bees be kept long enough in the box at any time to require feeding; but as a rule I have feed in these places all the time, then I am always safe. This completes all the box part.

Now crowd the colonies you have left in the spring toward full colonies, just as fast as possible, using all the plans with which you are familiar, or given in the bee-books, for keeping them warm, stimulating, etc.; and as soon as any one of them gets strong enough prepare it for queen-rearing as I gave on pages 46 and 47, Jan. 15th GLEANINGS, and continue to raise queens from this colony as you may require, for you can do this and not hinder this colony from contributing its share of bees for increase, as well as the others, as the queen is laying all the time in it. As soon as any of the colonies are full of bees, so they can spare bees from two frames, or from half a pound to a pound, and you have ripe queen-cells, take the cells out and put them into the queen-nursery to hatch.

As soon as the queens are one or two days old, go to any hive which can spare bees, take out two frames, being *sure* the queen is not on either of them, and shake the bees from them down through the funnel into the box, doing this about 10 o'clock. Having the bees in the box, set it in the cellar, house, or shop, or in some shady place where outside bees can not get at the bees which are confined, leaving it thus till about 5 P. M. Now get one of the virgin queens, put her in a cage having a stopper in it filled with queen candy, so that it will take the bees about half a day to eat out the candy and liberate her. Pick up the box of bees and suddenly set it down, when all of the bees will fall to the bottom, when you will quickly open the funnel-hole, put in the queen-cage, and secure it about two inches from the top of the box by means of a wire clamped between the slide and the top of the box, in closing the hole again. Now set the box away in a shady place, leaving it till just at sundown of the following day, when you will find the bees all contented with their new queen, and hanging to the box like a swarm. Then go to any hive that can spare a frame having a small amount of brood in it, and get such a frame, shaking the bees off, and replacing with a frame of empty comb. Put this frame in a hive where you wish your colony to stand, together with a frame of honey, or enough in it to secure the bees from starvation, and two or three empty combs, placing the one having brood in it in the center. Now lower the box of bees down into the hive, near the outside comb, and with your knife pry the wire-cloth frame off enough so the bees can run out freely on the combs, when you will close it and

adjust the entrance to suit the size of your little colony.

When you wish to make more little colonies, get your box, now free from bees, shut tight by driving up the nails, and proceed as before. A little later in the season you can form a little colony from each decent colony wintered over, twice every week, and take the same from your colony raising queen-cells too. Keep a good lookout for your combs, using those each time that may show any signs of moth-worms, and in this way you will not need to sulphur them if they are hung two inches apart so the light and air can freely penetrate between them. When the honey-harvest arrives keep plenty of combs on the strongest colonies so that plenty of stores can be stored in these for winter; and as the season advances, use more bees each time in making the colonies; and when fall arrives, if you do not have all the colonies you wish, and have plenty of sealed combs of honey for stores left, take bees from several hives, thus forming a strong colony at once, and hive them on these frames of sealed stores. I have so formed colonies in September, many times, and had them prove the best of any the next season. If you have some honey in your combs from which the bees died, and you are "sharp" in securing honey when the flow is on, you can increase 10 colonies in the spring to 100 in the fall, easily, by this plan, without any feeding or any outlay in cash for queens, feed, or any thing of the kind; and if the season is a really *good* one you can secure some surplus besides. The whole secret is in not commencing operations till the colonies are strong, nearly enough so to swarm, and then not robbing them of bees till they are too weak to work to the best advantage, using few bees for each little colony the fore part of June, and more and more as you go along, thus having all come up to full colonies in August and September.

I have had to be brief with this in order to get all in one article, but I think I have been sufficiently explicit so all can understand. If not, I am open for more questions at any time. Half a dozen nucleus-boxes and a funnel have become an absolute necessity with me in my apiary; for with them I can handle bees as I would potatoes, and make them stay where put every time.

[On reading the foregoing I am reminded that I left out a very important point; namely, that, when I practice dividing to form nuclei, I put into each nucleus more bees than they require, because I know that some of the old ones will go back home. The parent hive is sometimes robbed of all its bees. Those that return shortly, go back on to empty combs, after which they are given a comb of honey. By proceeding on this plan I never have any trouble but that bees enough will remain with the nucleus to take care of the brood. The Doolittle plan spoken of above will work, because I tried it when we were selling bees by the pound, and when we had the big funnel he speaks about, and cages prepared with food. But it seemed to me that at the time it involved a good deal of labor—much more than the one I practice.—ED.]

APIS DORSATA IN THE PHILIPPINES; A CHANCE TO GET THEM TO THE UNITED STATES.

Dear Sir:—After reading the above address perhaps you are wondering who it is that is sending you a letter across 11,000 miles of ocean and land. Well, to explain who I am, and the object of this letter, I will say that my residence is in Dallas, Polk Co., Oregon, and at the breaking-out of the Spanish-American war I was a law student in the office of Daly & Hayter. For several years I have been a very enthusiastic student of bee culture; in fact, it has always been my pet hobby. I have read GLEANINGS and your A B C of Bee Culture. When the war against Spain was declared I enlisted with the 2d Reg. Oregon Vol. Infantry, and we came with the first expedition to the Philippines. Our regiment was the first to land on Philippine soil.

I have read of the "giant bees of India," and the unsuccessful attempts of Mr. Frank Benton to get them to the United States on account of the exposure to fever in the jungles of India. Well, I write you this letter to inform you that the largest species of *Apis dorsata* is in the Philippines. Their colonies are numerous in the mountains. They build a comb five or six feet long, four feet wide, and from ⅞ to 1½ inches in thickness. In appearance the giant bee is a smoky, glittering, irridescent, black, wasplike figure with orange bands encircling its body.

Now, what I want to do is to get some of these bees to the United States, either by sending queens or swarms. Knowing your long experience in shipping bees and queens, I write to you, asking for information in regard to sending them—the cages, etc. It takes from 20 to 30 days to make the trip from Manila to San Francisco; and as I have read of your sending queens to Australia I don't think we should experience much trouble in sending from here. I have talked with several natives, and they have agreed to bring the bees from the mountains to Manila, for a small amount. Will you kindly help me out by sending advice, cages, and instructions for using? In return I will send you several queens for your own use.

JOHN C. UGLOW,
Manila, Philippine Is.
Co. M, 2d Reg. Oregon Vols.

[This is indeed "a streak of luck," as the boy said, that we have actually a modern beekeeper within so easy access of *Apis dorsata*. We have sent him full instructions how to send them by express, requesting that he send them to Geo. W. Brodbeck, of Los Angeles, Cal. The latter gentleman is to forward the bees on to us after he has given them a cleansing

flight and a "change of rations," but on no account is he to let the queens out. If our young soldier friend has not been shot down in the late battles we may expect shipments of *Apis dorsata* in the near future. Whether they will get through alive remains to be seen. We have offered him $25.00 for one queen alive; $35 00 for two; $45.00 for four, and $50.00 for five.

I have also heard from our missionary friend, Mr. W. E. Rambo, of Damoh, India, stating that he has got track of *Apis dorsata*. As soon as he can secure them he will prepare shipments and send them on.

It will be a joke if GLEANINGS gets ahead of the government in securing the big bees. At all events we propose to leave no stone unturned, and will get them if they can be secured. While I do not believe they will ever be of much value to us practically, yet we shall never know much about them unless we make the attempt.

If there are any others of our subscribers in India, Philippine Islands, or elsewhere, who will be in position to help secure for us *Apis dorsata*, we hereby give them notice that we will pay the above prices on the first shipment.

The daily press has given us enough free daily advertising of these big bees to create a large demand for them already. We are already getting calls. One man says he wants *Apis dorsata*—that he has not been able to get any honey with his common bees, and thinks it would be a good idea to "change my breed." —ED.]

THE RECENT FREEZE IN FLORIDA; ALSO SOME SUGGESTIONS IN REGARD TO PROTECTING FLORIDA STUFF.

The 13th of February Florida received a sad blow in the shape of a freeze. All tropical trees are killed as far south as Palm Beach, and badly injured in Miami. The orange, lemon, and grape fruit trees were very badly hurt as far south as Titusville, and injured more or less as far south as Palm Beach. My groves escaped with but little loss. A few of the orange-trees were in bud and bloom, and did not freeze so but I shall have a full crop of fruit. I banked with dirt about 400 of my youngest buds to save them, and had a few not banked killed. I have 15 acres out in grove, or 1500 trees, and the ground ready to set 500 more this season. My grape-fruit trees which you saw in 1895, Feb. 7, that were killed back to the trunk of the tree, averaged me $13 worth of fruit to the tree; and some that I budded at the ground in March, 1896, bore from $5.00 to $13.50 worth of fruit to each tree this year. This freeze has fixed the prices on good fruit for years to come. I had a good many tropical trees, but I think I shall have to leave these to Cuba and Porto Rico I had ½ acre of bananas under cover, with six inches of hay on top of the common cover, that were all frozen to the ground, and five acres of beans and five acres of Irish potatoes, some of them eight inches high. Tell A. I. they looked about like the little patch he saw at Weise's, Feb. 6, just before the freeze of 1895.

My bees are in good condition, but the recent cold will cut off some of the honey sources. I am running my bees in six different apiaries. I think people make a great mistake in having too many bees in one locality. H. T. GIFFORD.

Vero, Fla., Feb. 23.

ZERO WEATHER IN FLORIDA.

Mr. Editor:—About a week ago I wanted to tell you (but being very busy failed to do it) how the bees were working in this part of Florida. They came sailing heavily laden, and dropping in front of their hives like shot. The titi, that grand source of honey in this locality, had commenced to bloom. On the night of the 8th of February the mercury fell to 24°, and on the 9th a shade lower. The orange-trees had blossom-buds, which were all turned black; also the new growth. There have been frequent rains since August, and, preceding the frost, many days of warm misty weather, which promoted vegetation.

Last Sunday, the 12th, there was a cold rain, followed by snow and sleet, and vegetation was coated with ice. The cold increased, and finally the thermometer indicated zero; the 13th, ten degrees above zero; the 14th, a little below freezing. To-day, the 15th, there is a cold rain with chilly wind.

Our rejoicing is turned into mourning as we view the wind scattering the bright green leaves of our orange and lemon trees which we have petted and caressed for many years. Our garden vegetables are destroyed.

MRS L. HARRISON.

St. Andrews Bay, Fla., Feb. 15.

BEES FLYING OUT OF THE HIVE IN ZERO WEATHER; WHAT CAUSES IT?

My father has three colonies of bees in box hives under a shed facing the southeast. Yesterday evening at 4 o'clock, temperature 4 degrees above zero, one of the colonies (a hybrid) commenced flying out as they would during a heavy flow of honey in mid-summer, going only a rod or so from the hive, until, overcome by the cold, they dropped dead in the snow near the hive. Some carried out dead bees from the hive, and were chilled before they could get back. About a quart perished before they quieted down. The other two colonies on the same bench were quiet.

Chapmans, O., Feb. 11. W. L. MCGHEE.

[This is a rather hard question to answer. As it was a box hive, possibly a field-mouse, or even a rat, crawled up among the combs to get food and warmth; and if so, he would cause a general excitement among the bees. This would result in their flying out, perhaps, as they did. I could scarcely think that disease, or, more specifically, dysentery, would cause them to fly out in this way. In that case, the snow would be badly spotted around the hives. I have known mice to get into hives in winter time, and cause a general commotion. While the bees would be balled up in such a compact cluster as to make them almost insensible to *ordinary* disturbance, yet the *odor* of an animal crawling round their

quarters seems to harrow them up far worse than opening up the hives. The alarm is given, and the bees rush out naturally to find the intruder.—ED.]

CUBA, AND THE EXPENSE OF LIVING THERE.

I've been here but a short time, but I do not doubt that it is a good bee country; but there are other things to take into consideration, such as the difference in customs; the living expenses, the different values of money etc. Honey, they tell me, sells for half a dollar a gallon here; but a dollar of this money is only 60 cents in our money. Then the expense of living here is considerable. Meat is 30 to 40 cents per pound; milk 10 cents a quart; eggs, 5 cents each; kerosene oil, 50 cents a gallon; gasoline and alcohol about the same. This, in a country where it has to be used for fuel, is considerable. There is no wood about here. I have hard work to get enough to run a bee-smoker. C. F. HOCHSTEIN.

San Francisco de Paula,
Province of Havana, Cuba, Jan. 20.

A GOOD REPORT FROM CRAWFORD CO., PA.

Bees did well here last season; had the most honey for years, and of the best quality; little swarming, and went into winter in best of condition. Tell Mr. Dadant to hold his head up. I have three sizes of hives—one size very large—and my bees have always wintered best in the large hives, and made the most honey. Times here are good. We have had two of the best seasons here ever known; barns and cellars are fuller than ever before; every one who wants to work is at work; very few poor; no strikes; no tramps for the last two years. It looks as if our people were trying to do better, live better, and be better than ever before, and that their efforts were being rewarded from on high.

Steamburg, Pa. JOHN BALDWIN.

W. W., N. Y.—If your bees have plenty of stores I would not advise feeding as soon as they are put out on their summer stand. When settled warm weather comes on, feeding to stimulate brood-rearing may be practiced to advantage.

H. K. J., Ore.—You can begin to Italianize as soon as the bees begin to fly—the sooner the better. President Lincoln once said it is not wise to swap horses in the middle of the stream; so I would not advise Italianizing in the midst of the honey season. It should be done considerably before the honey-flow or after. In late summer or fall, queens are cheaper, and Italianizing can be done at less cost. Transferring should be done as early in the season as possible. We would usually say about the time of fruit-bloom.

C. E., Ark.—We know of no method of preventing honey from candying in barrels. The only thing to be done is to remove the top head, scoop out with a common spade into tin pails and liquefy it. This is a good deal of work, but is the only thing that can be done. When honey is put into square cans, as we recommend, the cans themselves can be placed on a coil of steam-pipes, or placed in a tub of hot water. This will restore the honey back to the liquid form.

W. L. C., Ky.—Propolis may come from various forms of plant life, because it varies in different localities. In one place it may be a transparent red and in another a muddy brown. The bees may gather propolis from the buds of the cotton-trees, and, where these kinds of trees are in abundance, may take it from them exclusively; but nearly all buds at certain seasons of the year have a certain amount of gum which may be utilized by bees, and the gum that exudes from the bark of certain trees may also be used at other seasons of the year.

W. F. B., N. Y.—There is nothing you can plant on as small an area as 50 feet square that would be in any real sense advantageous to the bees. Why, it takes almost a square mile of good clover-field to produce very much effect in an apiary. A single acre, or even a whole farm, of honey-plants would not keep more than ten colonies busy, if it did that. Years ago we had on our honey-farm something like five acres of honey-plants all told; but the bees in our general apiary robbed just the same, or wanted to, at least, when clover and basswood ceased to yield, thus showing that our special honey-farm was as a mere drop in the bucket.

R. L. M., Fla.—After queen-cells are made as described in Doolittle's book they must then be grafted—that is, be supplied with royal jelly and larvæ. Queens will not lay in them, and it is altogether improbable that bees would be so accommodating as to do the work for us. For further particulars see Doolittle's book. Sample foundation is too heavy. Your rolls should be screwed down tighter. Brood foundation should run from 6 to 7 feet to the pound, and surplus from 10 to 12; but on your mill you will probably not be able to get better than 9 or 10. It is desired to get the bases as thin as possible, being careful, of course, not to mash the faces of the rolls.

B. M. W., N. Y.—For reasons that I can not stop to enumerate, there are many objections to a house-apiary. If you have plenty of room in a yard, and are free from the depredations of thieves and meddlers, I would advise keeping the hives outside. It is pleasanter to work outdoors; and then in the winter, if the bees are put in chaff hives or in the cellar, there is much less danger of loss. No one has yet, so far as I know, ever succeeded in wintering successfully, year after year, in a house-apiary. There are many advantages, on the other hand, in having bees housed all the year round. For further particulars we would refer you to the A B C book, under the head of House-apiaries.

PERHAPS our readers have noticed that of late we have been bringing in short symposiums on some subject relating to bee-keeping. In this issue we have three different ones; namely, Cuba; proper pronoun to apply to bees; comb foundation.

IN our last issue I promised to give something more in regard to the matter of killing the germs of foul brood by boiling. A little symposium on this subject will be found on another page. I would call Mr. Taylor's attention especially to the article by Prof. Hodge.

SOME of our readers, I believe, will enjoy Stenog's usual introductory lines in Pickings. These are original, on the order of the burlesque, and were, he says, "written on the spot." I did not know before that he was a poet, or I should have had him "lining" before.

LATER reports seem to indicate that winter losses will be heavier this year than for the three or four years preceding, at least. Very few report more than 25 per cent loss. The principal losses this year will occur from bees wintered outdoors in single-walled hives. So far as I know, there has been very little mortality where bees have been put up as they should have been. Those in good dry frost-proof cellars, or in double-walled or chaff hives, are doing well everywhere, so far as I know.

THE editor of the *Review* has just gotten out a handsome prospectus entitled "Some of the Characteristics of the *Bee-keepers' Review;*" and in the line of fine-art printing it excels any thing that has heretofore been gotten out relating to bee culture. The *Review* is Hutchinson's baby, his only hobby, his specialty; indeed, his whole heart and soul are in it. He started with a little unpretentious paper, without any capital save the good will of bee-keepers, and now has a journal of which he may be proud.

IN the new magazine, entitled *What to Eat*, we find an article, "Honey as a Food," that is strangely familiar. It is none other than a liberal extract from Dr. Miller's honey-leaflet. This article appearing in a handsome magazine, and one that is undoubtedly authority on the subject of what to eat, will receive the recognition it deserves. I am glad that public sentiment is being awakened enough so that now there is actually a field for a magazine devoted exclusively to the subject of foods that are fit for human consumption.

PRESENT indications go to show that the last edition of 10,000 copies, making 62,000 sold, all told, of the A B C book, will be exhausted long before a new edition can be printed. We are running our $2500 press at its highest speed night and day, to print off some 200,000 catalogs, keep up our regular edition of GLEANINGS, of 10,000 copies, besides a multitude of little jobs. To print another edition of 5000 copies of our 400-page book, in addition to the above, means that our press has got to put in extra full time.

ON account of the great crowd on our columns, as spoken of elsewhere, I find it necessary to reject all articles bearing on the Dickel theory versus parthenogenesis. This subject is now occupying the attention of the foreign journals; and as there seems to be such a diversity of opinion among scientists I hardly think it will be profitable to take up space that we can devote to other matter that pertains more directly to the dollars-and-cents side of our pursuit. When the Dickel theory is settled, buried, or proven, *then* I think we can afford to give our readers the conclusion.

NOTWITHSTANDING we have been printing eight extra pages since Jan. 1, I find that I have a whole drawerful of excellent articles (sifted from a bushel more that have gone into the "waste-basket") that I should be glad to publish if I had room. Perhaps a little later I can find the space for them. For the present, at least, I should be glad if some of our correspondents would not shove their copy in quite so fast. In justice to the great mass of our readers I try to keep before me this one point; namely, to spread before them the very best I have; but very often I find that I am holding back matter just as good as I give to the public, for the reason that the line has to be drawn somewhere.

HONEY-LEAFLETS IN OTHER FORMS.

IN our last issue I referred to the suggestion of a correspondent, that the facts in the honey-leaflet should be put on a label, said label being large enough to go around the can. At that time I was not aware that any one had put the idea into practice; but I find that Mr. York, of the *Amer. Bee Journal*, has been doing this very thing. He sends me a sample of a very neat and pretty label designed, I judge, to go around tin cans. One portion of the label is devoted to the subject of honey as food; another sets forth the contents of the can, and the third and last portion has to do with honey-cooking recipes.

Mr. York also sends me his 1899 Honey Almanac, a booklet of 32 pages. Every alternate page is devoted to the calendar—the other pages being taken up with matter from the honey-leaflet by Dr. Miller. For further particulars apply to G. W. York & Co., 118 Michigan St., Chicago, Ill.

CHEAP VS. HIGH-PRICED QUEENS.

I HAVE just been wondering whether there would not be a call for $5.00 and $10.00 queens. Such queens should be tested, not only for purity of the bees, but for the even run of

their queens. The bees of the queen as well as the bees of her daughters should be good workers. It may take a whole season to determine all this.

Mr. Alley once said he had a queen for which he would not take $100. He sent us one of her daughters, and later on desired to buy her back, as his $100 queen had died. Not then knowing her exceptional value we let her go; but I learned afterward that her daughters were all evenly marked, and produced bees of excellent working qualities.

But it strikes me that, if queen-breeders could find a demand for $5.00 and $10.00 queens, we might, among the whole of us, develop strains of bees that would be very much superior to the ordinary stock of queens selling for 75 cents, and even as low as 50 cents. While we ourselves have catered to this demand—never, however, selling as low as 50 cents—I am inclined to believe that, if all queen-breeders had striven for higher quality, and demanded higher prices, some bee-keepers, at least, would be able to get more money than they have been able to secure with these cheaper queens.

THOSE PLAIN SECTIONS AT TORONTO; HOLTERMANN'S REPLY.

WHEN any one has been criticised for his statements or course of action, in GLEANINGS, I believe in giving that one an opportunity to defend himself in his own words. Mr. Holtermann has sent in a reply, and this I cheerfully place before our readers:

I am a little surprised at your letter in GLEANINGS in one paragraph. It says, "And what explanation is there for their being where they were privately seen (if I have the right idea) by Holtermann and others, and Holtermann, in the interests of fairness, didn't see that they *were* exhibited?"

I certainly was a little surprised to see GLEANINGS, which, I understood, put up so high a standard, get down to publishing insinuations as per above, and allow a correspondent to do it without an attached signature. Mr. Taylor showed me, and probably others, the case *after* judging had been done. I did not see it before. The paragraph unsigned is not Mr. Taylor's writing, for he is too honorable to insinuate that I, out of personal interest, allowed the honey to be unjudged. Several, evidently, saw the honey afterward; did any of those think that, if it had been exhibited, it would have taken the prize for the best-filled sections? I think no one would think so for a moment. When you stated in GLEANINGS that I borrowed the cuts to illustrate the article written against plain sections, you prejudiced the public against my arguments, and no retraction on your part could undo the unwarranted injury you then did me. Was it prejudice or carelessness when you stated that I had borrowed these cuts? To me it matters not what kind of sections the public use; but I have tried to keep bee-keepers from going to new expenses with an article which they may discard or find of no added value. If better honey can be produced with the plain sections, let bee-keepers send them to the Toronto Exhibition this year. I have yet to see as perfect a comb or section with plain sections as we have taken with the ordinary section.

I have nothing more to say in addition to what I have already said, only this: If plain sections have been better, then the plain-section men on one side of the line have been so modest that in no single instance have they sent them to the leading fairs; and if they are so modest they are a marked contrast to *some* of the advocates of plain sections on the other side.

Brantford, Can., March 6. R. F. HOLTERMANN.

In reference to those electrotypes, I published my correction before I was solicited to do so by Mr. Holtermann, and in the very next issue. Was it carelessness? Yes, it was that and nothing else, and I am not ashamed to acknowledge it. If Mr. Holtermann were willing to do as much, he would leave a better impression.

Mr. Holtermann's last paragraph is either a little mixed or else I do not understand him. If I do interpret him, he has contradicted himself, for he says that in no single instance were they (plain sections) sent to the leading fairs in Canada, and yet in his two preceding issues he says they were sent to the Toronto, Ottawa, and London expositions.

I might and could answer several other points in the above; but if I did so, then Mr. H. would ask for more space. I prefer to let our readers, if they are interested, judge of the merits of the case, and there let it drop.

AMALGAMATION IN PROSPECT.

VERY recently some correspondence has been begun, looking to the amalgamation of the old and new Unions, or what will be, when the thing is accomplished, the United States Bee-keepers' Association. General Manager Secor, of the U. S. B. K. A., has taken the initiative, through the advice and suggestion of the directors, and I have just this day received a note from G. M. Doolittle, President of the old Union, that will explain itself.

I note what is said relative to the uniting of the two bee-keepers' societies, on pages 188 and 189, of GLEANINGS, and I have this from General Manager Newman in reply to a letter of mine of recent date: "I note what you say about consolidation, and am quite willing that you should undertake the matter and work in your own way to bring it about. I am quite willing to *assist* in arranging *details*, as I always have been. No one will be more pleased to have the matter amicably adjusted, and the two organizations united for the purpose of doing effective work, than will I. I feel that, in leaving this matter in your hands, it will be properly done." As I am agreeable to the uniting of the two societies, and, so far as I know, all concerned are the same, it looks to me that this might be accomplished in the near future to the advantage of all. But I must be allowed to request as a favor that no extra burden be placed on my shoulders, for, through my sickness and broken bones, my work got behind so far that I am not nearly up with it yet, and I also feel that there are others more capable to deal with this matter than I am. But I will try to do all that is really necessary for me to do in the matter, as the oncoming future may point the way.

Borodino, N. Y., March 10. G. M. DOOLITTLE,
President National Bee-keepers' Union.

With every one favorable to it, it looks now as if amalgamation might come very easily; and the only thing now remaining, is, probably, to bring about the actual thing itself in proper legal form.

VERY often I feel like saying a good word for something advertised in our journal; but there is just one thing I *won't* do; and that is, father *any* statement made by an advertiser regarding his own goods. When I know the value of a thing, then I am willing to say a word. But there are other meritorious articles of which I know nothing personally. For all such we are for the present willing to let each advertiser, if he likes, say a word outside of his advertising space; and with that end in view we are going to start another department which our advertisers, who use as much as $10.00 worth of space, may use occasionally. This space will be limited to a single column, and each advertiser will be limited to not more than 2 inches of that space, and for a while, at least, it will be given free.

"WHEN shall discussion be cut off?" is a question that is discussed in the *Review*, especially when it relates to something outside of bee-keeping. My plan is, not to allow any thing to go into the bee department that has any reference to politics and the great social problems of the day. Not that I am not interested in these questions, because I take periodicals that discuss them more thoroughly and fully than could possibly be done in a journal that is (or ought to be) devoted to something else.

THE MICHIGAN FOUL-BROOD LAW.

Friend Ernest:—I inclose you a copy of the foul-brood bill now before our State Legislature. Will you please give it space in next number of GLEANINGS, and urge every bee-keeper in Michigan to write without delay to his senator and representative in the State Legislature to favor its passage?

GEO. E. HILTON,
Pres. Mich. State Ass'n.

Fremont, Mich., Feb. 23.

SECTION 1. The people of the State of Michigan enact, that, upon the recommendation of a majority vote of the members of the Michigan State Bee-keepers' Association, the Governor shall appoint for a term of two years a State Inspector of Apiaries, who shall, if required, produce a certificate from the Governor that he has been so appointed.

DUTIES.

SEC. 2. The inspector shall, when notified, examine all reported apiaries, and all others in the same locality not reported, and ascertain whether or not the disease known as foul brood exists in such apiaries; and if satisfied of the existence of foul brood, he shall give the owners or caretakers of the diseased apiaries full instructions how to treat said cases, as in the inspector's judgment seems best.

DESTRUCTION OF BEES.

SEC. 3. The Inspector, who shall be the sole judge, shall visit all diseased apiaries a second time, and, if need be, burn all colonies of bees and combs that he may find not cured of foul brood.

VIOLATIONS.

SEC. 4. If the owner of a diseased apiary, honey, or appliances, shall sell, barter, or give away, any bees, honey, or appliances, or expose other bees to the danger of the disease, or refuse to allow said inspector to inspect such apiary, honey, or appliances, said owner shall, on conviction before a justice of the peace, be liable to a fine of not less than fifty dollars nor more than one hundred, or not less than one month's imprisonment in the county jail, nor more than two months' imprisonment.

ANNUAL REPORT.

SEC. 5. The inspector of apiaries shall make an annual report to the Governor of Michigan, giving the number of apiaries visited, the number of diseased apiaries found, and number of colonies treated, also the number of colonies destroyed by fire, and his expenses.

EXPENSES.

SEC. 6. There is hereby appropriated out of any moneys in the State Treasury, not otherwise appropriated, a sum not exceeding five hundred dollars per year, for the suppression of foul brood among bees in Michigan. Said inspector shall receive four dollars per day and traveling expenses, for the actual time served, which sum shall not exceed the moneys hereby appropriated, to be paid by the State Treasurer upon warrants drawn and approved by the Governor.

SEC. 7. This act shall take effect and be in force from and after its passage and publication.

SEC. 8. By this act all previous legislation on the subject of foul brood on the statutes of Michigan is hereby repealed.

While this is not the same as the excellent Wisconsin law, it contains the essential features of it; and those features are the appropriation of an amount of money, not exceeding $500, and the appointment of an inspector who shall receive $4.00 per day and traveling expenses. A law without these essential features is like the play of Hamlet with Hamlet left out. We hope every man in the State of Michigan will do his full duty; and those who can should go to Lansing and do a little talking privately with the senators and representatives.

THE BOILING-POINT OF HONEY—WHAT IS IT?

IN Straws, Dr. Miller refers to what Mr. Taylor says regarding the difference between the specific gravity of honey and that of water, and suggests that Mr. Taylor may be right in assuming that the boiling-point of the former is much higher than that of the latter. I am surprised that neither Dr. Miller nor Mr. Taylor made the experiment each one for himself. Taylor, as you know, believes that the evidence of "one's own senses" is "a thousand times better" than the evidence furnished by some one else, whose skill is unknown.

I took two thermometers, each showing register-marks running up to 220 and 230 respectively. Of course, I expected that they would show a boiling-point, when plunged into water in a state of ebullition of 212 or thereabouts. But imagine my surprise when one recorded 220 and the other one 224. I then plunged them into boiling honey, and the mercury went out of sight, and doubtless would have burst the thermometers had I not withdrawn them in time; but as neither one could show more than 5 degrees above that of the *indicated* boiling water, it proved nothing; and, taken all in all, I was satisfied that the thermometers were not accurate, for the difference in sea-level could not possibly make that much difference. I finally found a thermometer (how accurate it is I can not say), that we use in our rubber-stamp department, that will record anywhere from 220 to 350 Fahrenheit. This I plunged into hot water, but the mercury did not rise up to the point where I could see it. I next plunged it into honey that was boiling—yes, it boiled all over the stove—and got a record of 232. If this instrument were accurate—that is, would show boiling water at 212 or 213—then there would be a difference of 17 degrees between boiling honey and boiling water. As the boiling-point did not show at 220, then I *know* there was a difference of at least 12 degrees. If this thermometer showed *under* the actual boiling-point instead of *above* it, as did the others, we should be as much at sea as before.

I feel very sure that some of our readers will be in position to use accurate thermometers and give us the *actual* boiling-point of honey as compared with that of water. A good deal hinges on this question.

In the mean time I think that, for the time being, *until we know*, my wholesale recanting was the safer side on which to err. Another point to be considered is that, if a scientist boils his foul-brood germs in beef gelatine, or

pure-culture fluid, the specific gravity of the gelatine will be about the same as that of honey—if any thing, greater. If he did the boiling in water then there may be something in the Taylor point.

PUSHING A GOOD THING; STANDING BY ONE'S CONVICTIONS.

I HAVE been criticised for pushing the merits of plain sections and fences; but the criticism has come very largely from those who have not tested them, and from one or two others who have tried them in a small way. To all such I have only the kindliest of feelings. I know it is natural for outsiders to think that the Root Co. would push them because of the few paltry dollars there would be in a new thing. Indeed, if I were an outsider I am not sure but I should share this feeling, because there are grasping monopolies, and one who does not know us better might think we were one of them. As to our being a monopoly, nearly every thing of value in beedom is as free as water—open to the competition of the world. But I hope we have a higher motive than that coming from the love of the "almighty dollar."

When I feel morally certain of the value of a thing, as I am of the plain section; when I have seen the results with my own eyes; when I have talked with the men who have used the thing, and like it; nay, more—when I have read scores of reports favoring it, I do not feel like backing down even a little. I would have been just as willing to back down in the advocacy of plain sections as I was in the case of the deep-cell (or drawn) foundation. But as time goes on, and as reports pile in, I feel more determined than ever to stand by my convictions. Favorable reports are coming in every day, as I have said before; but there is not space in the journal to publish them all. But here is one out of several that I had pigeon-holed to go into our letter-files. It speaks for itself:

I have tried the fences the past season; and if any season would show up the poor side of an appliance for bees or bee-hives, the last one surely would. I watched the outcome of using fences very carefully, and note the following: Two hives of bees, side by side, were given the second super each, one containing fences, the other old-style sections 4¼x4¼, no fences or separators, both having stored the first supers nearly full. The one containing fences stored nearly double the amount that the other did. Now, I found this to be the case all over the apiary; in fact, the bees seemed to give the preference to supers containing sections and fences, no matter whether they were next to the hive-body or two or three supers above. I won't say why this is so, but will leave that for you. As to the matter of cleaning fences, it is not a very great task, as only the uprights have to be cleaned; and the pleasure of having neat and even sections of honey compensates for whatever extra time is used. W. T. SHERMAN.

Millard, Wis., Feb. 13.

LARGE OR SMALL COLONIES?

IN the *Bee-keepers' Review* for February appears a symposium on this question, the subject-matter being made of extracts from various bee-journals, followed up by an extended footnote by the editor. He sets forth fairly the views of the different writers, but still clings to the opinion himself that the smaller hive is *the* thing. He finally summarizes the matter in this way:

Bro. Dadant's trouble comes from expecting and *getting* too much out of each queen. Instead of "horsewhipping" the queens, I would get more queens to help them. Hive your swarms in smaller hives, give fewer combs to each queen, and another year you will have mo e queens in proportion to your number of combs than you have now. Bro. Dadant says to himself, "Here I have 1000 combs and only 80 queens. I must give these queens all the room possible, so as to get just as many bees as I possibly can." *My* way of looking at it would be like this: "Here I have 1000 combs, and I want to get just as many bees out of them as possible, so I will have plenty of queens, and thus get the combs just as full of eggs as I can." You see that Bro. Dadant and myself are both after bees, but we go at it in a different way.

It does not seem to me that Bro. Hutchinson quite hits the nail on the head. It is not a question of whether one queen or a plurality of them raises a certain number of bees; but it is a question whether the colony shall be a large or a small one. As there can be only one queen in the hive, then (if the colony is a large one) one queen must be the mother of all the bees. But Mr. Hutchinson seems to take the ground that, as it is difficult to get a queen that will breed up to such a point, better have two queens in two colonies. But I raise the question right here: Suppose there are 5000 bees to the pound, and that there are five pounds of bees, or 25,000 to the average eight-frame colony. With two eight-framers we should have 50,000 bees. My theory and practice are that the 50,000 in *one colony* will bring in more dollars to the bee-keeper than the *same number* equally divided *in two colonies*.

It is well known that one large factory, for example, can manufacture more cheaply and make more money than two smaller factories of half the size. The same executive force of the smaller concern, the same book-keepers, the same clerks, the same foreman, can manage a producing force of twice the size as economically, or very nearly so. Perhaps the illustration is not quite parallel, but it serves to illustrate my idea. During the working season it is conceded, I think, that a large colony will have more working bees *in proportion to its size* than a small one.* But Mr. Hutchinson may bring up this question: Granted that there are more working bees in a large hive in proportion to its size, would such a colony make more *money?* Mr. Dadant has handled more bees—that is, operated more colonies—than any of the parties in the discussion. Others may have handled as many for a short time; but the Dadants as well as the Frances have each operated some 400 or 500 colonies for a period of 15 or 20 years, and have made *money* as well as honey.

* After I had prepared the matter it occurred to me at this point that there might be a question raised here. This I referred to A. I. R., and he replied something after this fashion: It takes fewer rods of fence per acre in a large field than in one of less size. In the same way there are fewer bees required to keep up the necessary animal heat per square foot of brood in a large colony than in a small one; that is to say, the bees that might ordinarily be required to act as nurse-bees, and to help sustain animal heat *in a small colony*, in a large one can go to the field. A. I. R. thinks it is almost an axiom that there are more working bees in a large colony *in proportion to its size* than in a small one.

They bind heavy burdens and grievous to be borne, and lay them on men's shoulders; but they themselves will not move them with one of their fingers.—MATT. 23:4.

Since I have had something to say about divine healing, a great mass of correspondence has been sent me, indicating that there is a deep interest in the subject. Periodicals explaining Christian science, faith cure, more than I can read, have been sent in. A good many insist that I am groping in midnight darkness; quite a few think that I exhibit my want of faith by using even such a remedy as hot water; but people in whom I have most confidence, especially the ministers of the different denominations, agree with me, I believe, as a rule. I may be in darkness, but I am praying for light, and I have faith in the great Father above to believe that he will give it. At the present time I can not agree with Dr. Dowie that it is never God's will that we should be sick. How could we appreciate health or freedom from pain if we knew nothing by practical experience of sickness and pain? I am sure God teaches *me* great lessons by permitting me to suffer; and while my fellow-men are obliged to suffer, I prefer to take my share of it—yes, even though it makes me at times groan with anguish, and causes me to pray for deliverance.

Since I have been confined so much at home, and many times obliged to lie on my back, I have been asking God to indicate to me what I shall read. I can not bear to sit still idly; and while there are great heaps of books and periodicals piled in upon me every day, it needs wisdom to choose what to read and what not to read. One Sunday, when it began to be evident that I could not go to church, I wanted something suitable for Sabbath reading. When I want something of sufficient interest to make me forget my pain, I often turn to a Sunday-school book, and I have never yet been disappointed. I have never found a book from our Sunday-school library that did not teach good and wholesome lessons. I wish I could say as much of the books in our town library. Well, on this particular Sunday the only Sabbath-school book in the house was by Mark Twain. I hope my good friend Twain will forgive me when I expressed surprise that any book he had ever written should be placed in a Sunday-school library; and for a while I could not think it quite the thing to read Mark Twain on Sunday. Then I remembered my previous experience, and concluded that the committee who selected the books must have had some good reason for selecting this one.

The title of the book is, "The Prince and the Pauper." I read it clear through during the day, and was both surprised and delighted to find that I could so thoroughly enjoy *any* book under the circumstances. If I am not a better man for the lessons I received during that one day, I certainly *ought* to be. The author does not choose any text to start out with; but I have supplied a text. A sort of legend, or tradition, we are told, furnished the foundation of the story. If the book were only published in a cheap form, I should delight in furnishing it to every friend I have in the world, at a very low price. May be it is—I do not know.

Away back, about 300 years ago, by a queer combination of circumstances a boy king was transferred from the royal palace to the slums of the city of London. For several days, or may be weeks, he was obliged to put up with the same sort of life that the poor degraded outcasts have to bear. He was obliged to submit to every form of injustice with which the laws of England away back ground down her subjects. In the back part of the book is an appendix giving us true copies of the laws and customs of that time. We sometimes speak about asking a doctor to take his own medicine. This young king was absolutely obliged to submit to the punishment that his laws were made to inflict on others. Perhaps the laws were not of his own making; but when he knew about them he had been permitting them still to stand on the statute-books. The book is a sort of turning things around. It says, in substance, what poor people often do say to those who are away up in wealth and high offices: "Suppose you change places with us just a little while, and see what you think of it."

Then there is another phase of this book that took a mighty hold on me. This penniless youth, without a friend in the world, kept proclaiming, "I am the king's son." But everybody laughed at him, and called him a madman. In one sense he was *worthy* of being king — he took it all patiently; he submitted to all their indignities in a way that was almost Christlike; but during all of that terrible experience of suffering, oppression, and wrong, he made mighty resolves to change things if he should once succeed in getting back where he belonged, for he never for one moment doubted that he would ultimately regain his crown and reach his own. Under the circumstances it was grand and noble in him to hold fast to the fact that he was king, or, if you choose, the king's only son. I hope my readers have read Pansy's conception of what it is to be a "king's daughter;" and in like sense we each and all of us may be, if we are not, *sons* and *daughters* of the *king*.

I now wish to tell you how the book did me good. When those terrible zero days were upon us I went all over the factory to see if the rooms were comfortable for the men to work. Some of the drip-pipes were frozen up; but we soon got them free, with the exception of one radiator, or, rather, long coil of pipes. The heat went only half way through; and the men who were obliged to work near that west wall, exposed to the zero blasts, where the pipes were cold, really suffered. I called Harold to help me. He is the young plumber I have often mentioned. We followed the drip-pipe of this coil down through three stories below, warmed it up with hot water

and lamps, but all to no avail. When I came around again I found the pipes were still cold, and said to the men, "If you can keep on with your work just a little while longer I will get the steam through these pipes. I am sure I can, for I never yet failed when I stuck right to it." Well, I fussed with those pipes all day, but I could not get the steam through. I consulted the "boss plumber," and he said the drip *must* be freezing up somewhere, for there *could* not be any other reason why it should not heat up as it had done every day all winter. During the middle of the afternoon I decided there was not pressure enough, and so I got the engineer to give more pressure on the exhaust steam. This, of course, loaded the engine more, but it was only temporary. It did not make any difference. The men stuck to their posts and kept at work. I pitied them from the bottom of my heart, and felt disgusted with myself to think that I could not unravel the mystery. I went to Ernest and John about it, thinking I could get sympathy, even if I did not get any mechanical assistance; but they just laughed, and told me not to worry myself out (and catch *more* cold) about the pipes; if the men got so cold they could not stand it, let them go home. But I knew these men sadly needed the money for every hour they worked. Besides, it was quite important that the work should be pushed ahead. The day's work was finally ended. The men stuck to their work, but the mystery was unsolved. I told the night watchman I was going to have steam through that coil of pipes, even if it took all night to do it. Then we managed to turn on "live" steam; but even live steam would not go through. I took hold of the valve and turned up it until it was closed, and—*then I swung my hat.* Turning the stem of the valve out and in made no difference whatever. During the day I had suggested to the foreman of the piping that it seemed as if that valve was stopped up; but he declared it could not be, for it was certainly wide open, and it was a *brand-new valve.* I went after him when I made my discovery, for he happened to be in the factory, and asked him to get a wrench. A few minutes revealed the trouble. Even though it *was* a brand-new valve, and cost quite a little money, the disk that opened and closed the passage had come loose from the stem, and was stuck in the seat. The only steam that could get through, either live or exhaust, was what got through the center of the disk. The next morning, when the whistle blew, the radiator was hot, you may be sure. Now, perhaps people do not often suffer this way in factories; but this illustrates the way people at large *do* suffer from defective machinery; the same in the way of framing laws or governing nations; and unless the king or the law-makers "swap places" with the working people once in a while, who would see to it that these wrongs are righted?

At another time, on going into the sawroom the air was so full of dust it made me cough so that I could not have stayed there many minutes at a time. I asked one of the men what the matter was, and he said the dust-pipe was off from his machine. When I asked why it was not put on he said it filled up right away, so it was no use, and so they just pulled it clear off. I asked him if somebody was remedying the defect, and he said he did not know. The foreman said they had been fussing with it, but the matter was dropped, and he did not know what they were going to do. I traced the matter up, and was told that the large belt was loose, but they could not very well fix it until they shut down at night. I then explained to the men who were suffering, and asked them to get along as well as they could. If they stopped work it would stop the work of the men ahead of them, and so there seemed to be no way but to put up with the dust. I got over in the morning as soon as the grip would let me go, but they were *still* suffering from dust. I was told the belt had been repaired the night before, but the room got so cold during the night that the glue did not hold. On a similar occasion before this, some coal-oil lamps had been kept burning by the night watchman, so as to keep the glued joint warm enough to have it dry thoroughly. I inquired why the lamps were not used the night before, but I was told it was because nobody looked after it. I should have looked after it, probably, had I not been "under the weather." Now, I hope no one will feel hurt when I suggest that there seems to be a sort of indifference all around in regard to these necessary details. If the men who are obliged to bear the dust had had a chance, I am sure they would have put in vehemently to have that belt looked after so there could not be any failure.

Now please do not think, dear reader, that I attend to *all* these things as I might do and as I ought to do if I really loved my neighbors and my fellow-workmen as myself. I need exactly the stirring-up that Mark Twain's piteous appeal in that book gave me; and the whole wide world needs stirring up in just this way. Jesus came and lived and *died* to exhort men along this very line. He said not only in words but by acts, "Not to be ministered unto, but to *minister.*" Now, I know we are not all proprietors of factories; we are not all kings and princes, nor even high officials for the government, nor superintendents of railways or other institutions; but we usually get into these high and honorable places because we are faithful. The Bible says so. "Thou hast been faithful in few things, I will make thee ruler over many things." We are none of us as faithful in the little things as we ought to be. The little incidents of everyday life will illustrate it. You can not hang up a bright tin cup at any well or spring, because somebody will carry it off — not dishonest people necessarily, but I do think they are *selfish* people. A carriageful of ladies carried off a tin cup from the well right out in front of where I am writing. They drove up, passed the cup all around, and seemed to enjoy thoroughly the water that was running freely, purposely for the public benefit. *But they carried off the cup.* Perhaps they *forgot* to hang it on the nail by the hydrant. Is not *forgetfulness* largely selfishness, when you get

right down to it? Dr. Miller says if you will punch a hole in the bottom of a drinking-cup it will not be carried off. Just think of obliging everybody to stoop over, while he slakes his thirst, to keep this stream of water away from his clothes and polished boots, just because of this very custom of carrying off the cup! Borrowing tools and keeping them is along in the same line. There are few things that make me so much care and worry as to look after our gardening-tools, especially in seeing that they are brought home. A near neighbor, and a good man—at least I call him so—borrowed my scraper last fall. I inquired about it several times, and gave orders to have it put away in our dry toolhouse; but in spite of me it has been out of doors all winter. Is this world *too full* of cares to permit anybody to look after *every* thing, especially these *little* things? Well, most people manage to find time to look after things that seriously interfere with their *own* comfort and happiness; but how many of us look after the things concerning the comfort and happiness of our friends and neighbors just as well?

Now, there are a great many paupers in this world, but there are very *few* princes; but I honestly believe there ought to be more. There ought to be more girls and women who are ready to say, with honest pride, "I am one of the King's Daughters;" and then there ought to be more men and boys who are ready to say with equally honest pride, "I am one of the King's Sons." If anybody asks you what king, tell him the King that came into this world, not to be waited on, but to be a *servant*. Pilate said unto Jesus, "Art thou a king?" Jesus answered, "I am a king. To this end was I born, and for this cause came I into the world, that I might bear witness unto the truth." The world may not recognize us; but, never mind; neither did it recognize the King of glory when he passed all about among humanity. When we are prompted to be selfish, and tempted to do that which is wrong and beneath the character of a *prince*, let us say in our hearts if not aloud, "No, I am a prince—the son of a King." We are told to beware of pride; but here is a place where a little more pride would do us good.

And now may be these words will strike somebody who has charge of a lot of men; or a teacher who has under his care a lot of children; or a minister who looks after and sets an example before a lot of people. Shall we not, each and all, remember every little while to (at least *mentally*) change positions with those under us? "As ye would that men should do unto you, do ye even so unto them."

ANOTHER SIDE TO "LEAVES OF HEALING."

A subscriber sends us the following, clipped from the Chicago *Interior:*

The death of Mr. Henry Walter Imler, of Fremont, Ohio, is a pathetic instance of the illusions which Dowie practices upon good and faithful men. Mr. Imler was a worthy member of our church in Fremont. He was smitten with cancer, a disease which is marked by medical charlatans as the one which offers the largest possibilities for fraud and financial bleeding. Mr. Imler was induced to submit himself to Dowie, who seems to know enough about palliative medication for his purpose; he persuaded Mr. Imler that he had effected a cure, and filled pages of his publication in heralding the case. Thus having both lined his pockets and obtained the means for inducing others, Dowie sent Mr. Imler home to die. It is no reflection upon Mr. Imler's memory that he fell a victim to such delusion. For all like cases unprincipled practitioners or pretenders lie in wait, and it is not in hopeful human nature to lend a deaf ear to assurances under such circumstances.

SOMETHING MORE ABOUT GRIP, ETC.

In another column I have told you of the trouble we had in finding out what the matter was with the steam-pipes, that they would not heat up. In a large factory where there is much machinery and complications of pipes, wires, etc., a great many times there are troubles that are hard to find. A great many people give up, and say, "Well, I do not know just what is the matter with the thing. If somebody else can fix it, I wish he would do so." And somebody has to do it. Sometimes it takes a good while, and takes lots of money. But the person who ferrets out the mischief, and corrects it, gets a feather in his cap, so to speak. We often read in the papers about detectives, how they work and study and follow each little clew. Well, I have been somewhat of a detective along this line all my life; but instead of following criminals, mine has been a pleasanter work, for I have followed Dame Nature, and wrested from her her secrets. Dame Nature I love, and I believe she loves me; for she has always rewarded me for my time and pains, sooner or later. I found out why the pipes did not get hot, but I fear some of my friends suffered grievously from the cold, as it took me so long to get at the mischief. When I was telling Mrs. Root about it, and describing to her the way we drenched the poor pipes with the boiling water, and then smoked them up with a kerosene torch, etc., she said it made one think of the way the doctors sometimes use powerful medicines, and even resort to surgery, while the real mischief is perhaps away off in another part of the body.

I told you about my tussles with the grip. By applications of hot water my teeth got well and sound, and the pain in my ear went nearly all away. But after the zero weather was passed, and it began to be wet and rainy once more, I caught cold again, and this time it centered in the calf of my right leg. I limped around for a few days, and then gave up trying to walk; pretty soon the pain became so severe that I had to lie down. The contrary thing would not even permit me to sit up in bed. Unless I lay flat on my back, with my leg in an easy position, the pain was almost unbearable. It was a curious thing and I began to study it. I tried all sorts of liniments, tried brisk rubbing, but none of these things did a particle of good. Electricity gave relief

so long as the current was applied, but the pain came back promptly as soon as we stopped turning the crank. By the way, there are a lot of such remedies. They may give one a little respite, but they confer no permanent benefit. More than forty years ago I took the agency for an electric apparatus for the cure of diseases; but I never sold a machine, because I was very soon satisfied that electricity gave no permanent benefit; and I have followed all sorts of electrical appliances from that day to this, and I am still of the same opinion. Of course, the pain in my leg was not always alike. Sometimes it went away so I could walk around quite well. Then, again, it came on quite unexpectedly. It behaved so much like the pain in my back after I had that "crick" that I began to connect the two. Yes, you may be sure that I prayed about it all along, and I prayed with faith—not that I might have relief from pain, so much as that the great Author of *all* life might lead me to understand better that I might teach others, and teach them truth; and my prayer was answered. Inasmuch as the hot water in my nostrils, described and figured on page 104, cured my tooth and ear ache, it one day occurred to me it might possibly have some effect on the painful and swelling limb. I took perhaps two quarts of water, as hot as I could bear it, through my nostril. I sent it with force enough so a part of it came through into my throat. When the stinging sensation, something like strangling, became too severe, I raised my head enough to give less force to the stream of water. In a minute or two the respiratory organs and the organs of the ear that had been affected became warmed up, so there was quite a discharge from the nostrils and throat—that is, by sneezing and clearing my throat—and the heat was sufficient to induce considerable perspiration;* and, sure enough, my leg was free from pain. After having sneezed and expectorated, I would feel well enough to go over to the factory and read my letters. Mrs. Root laughed when I told her I could cure my *leg* by applying hot water to my *nostrils*. The neighbors laughed. I presume they thought I was a sort of hot-water crank. Yes, and the doctor laughed (for I had called the doctor in to know if it could be inflammatory rheumatism that was crippling me); but after I showed him my apparatus, and gave him my explanation of the matter, he owned up that I was *probably right*. He said a great number of his patients had been troubled with the grip in the ears, face, nostrils, and teeth. Some of them had had their teeth pulled, thinking that might help the matter; but it did no good. Others had suffered excruciatingly, and finally an abscess or something of that sort had formed in the ear or nostrils, giving no relief until it broke and discharged this foul matter. He said, by the abundant and free use of water, and by keeping the passages open between the ear, nostrils, and throat, he felt sure such troubles might be prevented.

* Sometimes the hot water brought tears also, from the eye nearest the trouble: but they were not tears of sorrow, for with the tears came freedom from pain.

The trouble in my leg was, without question, neuralgic pains that had their origin in the organs of the head. Perhaps the crick in my back, a month before, had served as a sort of communication with the leg; and in my case the grip had confined itself *entirely* to my right side. Now, what sheer folly to put liniments, electricity, plasters, or any thing else, on the *leg*, when the real trouble is in the *head!* I think I have heard somewhere of curing bruises on one's heel by putting a plaster on the top of the head, and you see I have been getting pretty near to it.* I do not know but some of our medical friends will think I am taking a great deal of liberty in presuming to teach; but I believe the more sensible ones will tell me they have had many cases quite similar. There is this comforting thing about the hot-water treatment: After you get well you know you have not injured some other organ of your body with some powerful drug that perhaps did not hit the spot at all.

I hope that this little story may help somebody else out of similar troubles, and give relief to suffering. I have had several communications in regard to the vapor-bath treatment. It is probably right along in line with what I have said. Of course, the hot-water spray I have described takes much less time and trouble; for five minutes is plenty of time to rinse the nostrils thoroughly after you have the apparatus rigged.

Since the above was put in type I find the following on a scrap of newspaper:

> The famous Dr. Salisbury frequently made the statement that, if he were to be deprived of all means of cure except one, he would choose hot water, thus proving his right to be called a wise physician.

How refreshing it is to discover that great (?) minds usually run in parallel channels!

ORIGINATING NEW VARIETIES OF STRAWBERRIES AND POTATOES.

On page 148 I said you might grow a whole acre of seedlings, and not find any thing better among the lot than the potatoes and strawberries we have already. Friend Cook, who advertises potato seed in the same issue, thinks I put it too strongly, and perhaps I did. I wish those who have furnished a valuable potato or strawberry for the people would correct me if I need correcting. Friend Manum has given the world a valuable potato, and he has been at work at it a good many years. I

* In the case of the pipes, the cause of all the trouble was more than 100 feet away from where we had been fussing with lamps and hot water all day long; and the neuralgic pain, where I had been fussing with liniment, hot water, rubbing, etc., had its origin in nearly the most distant point in my whole body. Perhaps I should add that, during all this time, there was more or less of a dull pain in that ear. It felt somewhat stopped up, and was more or less deaf, although it had so nearly recovered I had thought but little about it.

wish he would tell us something what the chances are. If you have seed to commence with, from some of the *best varieties known*, of course this should make a difference; and when one does succeed he confers a lasting favor on the whole wide world. The man who gave the Concord grape, by that one stroke supplied the world with a beautiful, wholesome fruit at a price that was never dreamed of until the Concord became known. So it is with other things. It is a grand work to engage in—working for new and better varieties; but whoever starts into it should have a fair understanding as to what his chances are.

SUB-IRRIGATION IN THE OPEN AIR.

All attempts in this direction, or nearly all, so far as I can learn, have been mostly failures. For greenhouse benches, where we can control the amount of water applied, and where rain is kept off by the sashes above, the plan is all right; and one might suppose it would work all right in the open air in California and other climates; but the California *Cultivator* decides it is a failure even there. Irrigation of any kind should be in sight, so you may know what you are doing. Another thing, the water should not be down too low. Here is a suggestion from the above publication, and one that I feel sure will work for strawberries and other garden stuff where the roots are near the surface:

Where plants are set in close rows and are not very deep-rooted, but want water often and in moderate quantities at a time, lay a line of common drain tile with backs flush with the surface between the rows. Through these one can run water so that it will wet each side for a foot or two and moisten sufficiently up to the surface, yet without making the top soft enough to bake.

In order to make the above plan work, your ground must be nearly level, else the water will all run down to the lower end without wetting the plants where it starts in. The joints in the tiles will permit you to look down through and see what the water is doing; and when heavy rains come unexpectedly, these same tiles will act like surface drainage. You know I have for years declared that, when we had a great abundance of rain, as was the case last fall, our ground should not only be underdrained, but it should be surface-drained, and these tiles laid just below the surface of the ground will make the best kind of surface drainage. Of course, all the cultivating must be by hand-tools. If you are growing strawberries, when it is desirable to put something else on the ground to get the usual rotation of crops you can easily take up your tiles, prepare your ground thoroughly for some other crop, and then put your tiles back again if you want them.

A NEW TRICK IN LAYING TILES FOR UNDERDRAINS OR OTHER PURPOSES.

This new invention (for I think it is worthy of being called such) will apply to laying tiles for sub-irrigation or for any other purpose. In fact, whoever has dug ditches by hand, and laid the tiles, has doubtless been disappointed when standing at the end of his ditch, and looking up or down the line of tiles just before they are laid to cover up, to see so much "crookedness." I have actually spent more time than I could really afford to in dressing out the bottom of the ditch with the proper kind of scoop to make the tiles lie with an even grade and in a straight line, both up and down and sidewise, to find my careful work, when reviewed from the top of the bank, look more like a worm fence, both up and down and sidewise, than like tiles laid as the books and papers direct them to be laid. Some of you may say it does not matter, if they carry the water all right. But they *don't* carry the water all right. If you have ever had occasion to take up a line of tiles, and have seen how the mud accumulates wherever there is a little bend downward, you will realize the importance of having tiles laid true and on a line. Well, this new invention consists in having a smooth straight round pole that will just slide through the smallest of your tile. This pole may be six, eight, or ten feet long — the longer the better if you can keep it straight. Have a small stout ring in one end, and an iron hook to catch in the end to draw it along. Lay your tiles with this round wooden rod inside of them, but do not pull the rod out until you have packed the dirt all around your tiles so they will stay in place. Now catch hold of the iron ring and pull the rod along, slipping on more tiles, and so on. In this way the joints match exactly on the inside, where you want them to match; and your tiles strung on this rod are just as straight as a string can be stretched—that is, if your pole is straight. A piece of gas-pipe perfectly straight, and of the proper size, is just as good as the pole, only it is rather heavy to handle. I saw this illustrated in some periodical; but I actually can not give credit just now, for I have forgotten where I saw it. If somebody will tell me where it was first pictured and described I shall be happy to give credit.

SOY BEANS IN KANSAS.

I take the following from Bulletin No. 24 of the Kansas Experiment Station, Manhattan, Kan.:

The Kansas Experiment Station has been growing the soy bean for the past ten years, starting with a small patch, and increasing the area until last year 35 acres were grown. It is a good drought-resister, is not touched by chinch bugs, and the beans are richer in protein than linseed meal. With sufficient moisture to germinate them, a crop can be grown after wheat and oats are harvested. In 1896 the yield on ground after wheat was 8 bushels per acre, in 1898 6¼ bushels. With linseed meal at $25 per ton, these crops after wheat would be worth $6 and $4.68 per acre. When planted earlier in the season, the yield of soy beans is from 10 to 20 bushels per acre. The soy bean not only furnishes a crop rich in protein, but at the same time enriches the soil. Henry Rogler, one of our graduates, reports an increase in large fields of 5 bushels of wheat per acre on land where soy beans had previously been grown, over land that had not been in soy beans.

The point that interests me especially is the last sentence in the above. You not only get a crop that pays, but your land is better off to the extent of five bushels of wheat per acre after the crop is taken off and sold. The same bulletin gives the results of feeding soy beans to pigs. It tells how to grow and harvest the crop. Our Ohio Experiment Station agrees, I believe, with all the above.

HOW TO GET EXTRA-EARLY POTATOES.

The following is from a press bulletin from the Kansas Experiment Station :

The Horticultural Department has been experimenting for two years on the methods of hastening the growth and maturity of early potatoes. On Feb. 23, 1897, tubers of White Ohio, Beauty of Hebron, Early Harvest, and Carman No. 1 were set in shallow boxes with the blossom ends up. They were filled around with sand, leaving the upper fourth exposed, and the boxes placed in a room of rather subdued light, and a temperature of 50 to 60 degrees. Vigorous sprouts soon began to push from the exposed eyes.

On March 22 the potatoes were planted in furrows, the tubers being removed carefully from the sand, and planted in the same position in which they stood in the box, and 14 inches apart in the row. They were not cut, but were kept entire. Similar parallel rows of each sort were planted of whole tubers selected from potatoes taken from the storage room, and unexposed to light till planted.

As they grew, the sprouted potatoes took the lead from the start in vigor and strength of top; and both lots of whole seed kept ahead of cut seed of the same varieties. June 1 the sand-sprouted lots showed excellent young table potatoes while none of the others were yet large enough for use. A week's difference was apparent in the two lots. On June 16, the sand-sprouted potatoes were still ahead in size, though not as much as at the first examination. At the final digging, July 24, the sand-sprouted lots showed better tubers, and 10 per cent larger yields, than the others.

In the spring of 1898 a similar experiment was carried on, using four other varieties; viz., Triumph, New Queen, Thoroughbred, and Early Six Weeks. Two methods of treatment were also employed. The lots were divided, one half of each lot being placed in sand under the conditions employed the year before, and kept moistened, the other half of each lot being put in open boxes, and placed in a light dry room with a temperature averaging about 50 degrees. March 26, all lots were planted. The tubers that were placed in sand had strong vigorous sprouts, and were nearly all rooted. Those in the open boxes were beginning to sprout, but of course had thrown out no roots. The sand-sprouted lots took the lead in growth, and furnished table potatoes several days in advance of the lots sprouted in open boxes, although the latter were ahead of the lots planted at the same time from the storage-room.

Whole tubers sprouted in rather moist sand, and planted about the 25th of March, give the best results, and produce table potatoes seven to ten days earlier than the same variety planted at the same time but not so sprouted.

Such a difference in time is of great importance to the grower, whether the crop is for the home garden or market. The gain of a week's time will well repay the efforts required to produce the extra early crop.

W. H HALL.

The above is simply a modifiation of the method employed in the Island of Jersey. Please notice the potatoes are set in moist sand about a month before the usual time for planting. We have failed several times by getting them into the open ground too early, so the potato-plants got a setback by being nipped by the frost. In our locality I do not believe it will pay to put them in the open ground before about the middle of April. If a frost comes, of course you can pull a little soft dirt over the sprouts—that is, if they are not too far above ground.

POTATOES THAT DO NOT SCAB — THE WHITE ELEPHANT.

I have raised the White Elephant potato, and have been acquainted with it for 18 years, and have never known it to scab, although others planted alongside were so scabby as to be unfit for use They are prolific, and fine potatoes for the table, being a smooth white, rather long, and flat-sided. Our neighbors have all got seed of us, and have never heard of scab or a failure of crop. MRS. R. E. HAMMOND.

Saylersville, Ky., Feb. 28.

The above potato is comparatively well known; but I have never heard before that it was less liable to scab. I notice that Landreth, in his catalog, describes it as late, does best in light sand, heavy yielder. He quotes it in January at $2.70 per barrel. Has anybody else noticed this same peculiarity in the White Elephant?

COW PEAS—HOW TO CURE THE HAY, ETC.

On pages 148 and 149 I note what is said of "cow peas." I live in a section of North Carolina that was growing cow peas as a renovator of the soil, and for feed to stock as forage, before Prof. W. F. Massey left the "Miller" school in Virginia to go to our North Carolina Experiment Station. I don't know the Benson pea by that name, but there are a great variety of cow peas. Some of them mature in 60 days from planting, hence *should* mature anywhere north. Cow peas ripen very irregularly. There can always be found ripe peas and blossoms among any variety of them, as the first ripe peas appear. And if the ripe peas are kept gathered off the vines, these same vines will continue to blossom and bear peas for a long season.

They require warm weather to grow in, hence should not be planted till *two weeks* after all danger of frost has passed.

Peavine hay is obtained by sowing the peas broadcast at the rate of 1½ to 2 bushels per acre, and then plowing them in, or cutting them in with a disk harrow, without allowing them to lie in the hot sun over two hours, exposed; if you do they will not come up well. When the first ripe pods begin to show, mow your peas down after the dew and moisture have dried out. In the evening, before the dew falls, rake it into large winrows and let them remain until the next evening (unless it threatens rain; if it does, pile them in cocks of 400 or 500 lbs.); then go and cock them up in cocks, the same as other hay, 5 or 6 feet high, and as small at the bottom as possible for them to stand up well. After being cocked up for 4 or 5 days, so they have wilted, and the stems of the vines are reasonably dry, thus being air-dried instead of sun-dried, they are ready to be put into large stacks, or hauled up to the barn, but should be exposed so all the air possible will pass through them—in either event until the stems are dry enough to break when bent.

Never feed peavine hay, that has been frost-bitten, to stock. Cut when the first dry pods show, then air-dry by any plan you like. By not letting it get damp or wet after it is cut until it is thoroughly cured you will have some of the finest green or bright forage you ever fed, and all stock eat it readily; will leave other hay or forage for the pea hay. Getting wet turns it dark, and creates a dry dust among the vines and stems If left to mature peas before it is cut, the leaves all shed off and you have nothing but dry stems and vines that are tough and little good.

Goldsboro, N. C. ABBOTT L. SWINSON.

A NEST-EGG THAT KEEPS OUT VERMIN.

I believe my first hobby in the way of any sort of business was raising doves; and when some wicked sportsman shot one of my pair of doves, oh what wailing and weeping there was around our home! and I do not know but I have had a spite against sportsmen—yes, and against guns also — ever since. Well, when I got a little older I went into the egg business, and I succeeded too; and every little while through the fifty years that have passed I have felt a longing to study "chickens" once more. Well, here is something from the *American Cultivator* that took my attention strongly :

ONION-PEELING IN HENS' NESTS.

One of the best materials for making hens' nests is the outside peel of onions It will drive away if it does not destroy hen lice. These peelings, or a piece of the onion itself, ought to be always in nests where hens are sitting on eggs. The warmth of the hen's body will so scent her feathers that the lice will be glad to clear out, and the hen will be equally glad to have them do so. With a good place for rolling in the dust, under cover, so that the dust will not be turned

into mud, it is not difficult to keep hens free from vermin.

Now, in the above there is no hint of using a white egg-shaped onion for a nest egg; but it came into my mind like a flash that our White Victoria onions would fill the bill exactly. Mrs. Root says the hens would kick the onions out, and refuse to be humbugged; but if some of our nice Victoria onions are not a better imitation than a great part of the nest-eggs commonly used, then I will give up. Just try a hen that wants to sit on a nestful of white onions. If the hen does not do *her* part, I shall be mistaken. (Whenever you set a hen, always put in *one* white onion.) Well, now, friends, if in the course of time the standard nest-egg of the world should be a *white onion*, won't you all bear witness that Uncle Amos first suggested the idea?

Our Roll of Honor.

Friend Root:—I have been a subsciber to GLEANINGS since 1883, and have received "real estate" benefit from its teachings in apiculture, and especially from Home teachings. I want it to live and benefit others.
Joy, Ill., Feb. 14. W. M. MILLER.

I have taken GLEANINGS so long that I don't think I can do without it unless my bees all perish. I have been looking over my old GLEANINGS. The oldest are of 1879; but as I have been in the habit of giving them to others who cared to read on the subject after I had read them I am not certain when I commenced taking it. J. B. HAINS.
Bedford, O., Feb. 20.

I can not exactly tell the date when I began reading GLEANINGS, but I think it was in 1874, at Salem, Ind., where I resided until the fall of 1883, when I moved to Florida. I have not kept the papers having friends who were desirous of reading them, and very few of them ever returned home. GLEANINGS all these years has been a great and shining light to me in many dark places. May its light continue to shine and grow brighter long ages after you and I are no more on earth. JOHN CRAYCRAFT.
Astor Park, Fla., Jan. 9.

Friend A. I. Root:—I think I have taken GLEANINGS over twenty years, and followed you through the *American Bee Journal*. I recollect reading about windmill, four-horse-power engine, then forty, and up to the present. I do not take GLEANINGS for information about bees, as I have none; but I like your Home talks and information about home comforts, gardening, etc. I think I can say your writings have done me good, and have helped many times to lift me out of self (in mind), and led me to think of higher and better things. I wonder how many take GLEANINGS for the above consideration. WALTER SENIOR.
Webster, W. Va., Jan. 21.

Dear Mr. Root:—I have been looking over that Symposium of the Veterans again, and I see the "25 years, more or less," takes me in also. I don't want the present, but I want to express myself in regard to some things I think I took GLEANINGS in 1880 or '81. I was then in Spotswood, New Jersey. I invented (or, rather, discovered) *one* way of imbedding the wires in foundation; that was, I think, in 1882. I took a sewing-machine needle, broke it at the eye, stuck the point in a handle, and then ran the broken eye over the wire and pressed it down. All was common, no patents. If any one discovered any thing new it was turned over to Bro. Root, and tried. Well, as a token of appreciation GLEANINGS was sent without pay. All your veterans seem to be bound to be helpful. If they have any thing that can benefit fellow-bee-keepers, they go to some trouble to give it freely.

But there is one part of GLEANINGS which is like the flashes of sunshine in a beautiful landscape; and that is Our Homes. I send GLEANINGS to my mother, over 70 years old, when we are through with it, and she enjoys reading it.

I understand you, Bro. Root, from Jan. 15th and following numbers. Those who *don't*, really miss the cream and honey of life. I send you a hearty amen! I had a brother (he is dead now) who came to Dakota, bought a quarter section of land and two yoke of oxen (stags), and went to breaking. It did not go very well. If you ever plowed with two yoke of oxen you know all about it. Somebody was concealed in the tall grass near by. Brother had great trouble. He got very angry, and it seemed as if he had to give it up; but he knelt right there by the plow, and prayed the Lord to forgive him for getting angry, and to help him. He placed all in line, and started again, and, lo! all went smoothly along, and he broke a great many acres of prairie that summer. Those who have had the experience know that there is much in the hymn, "Take it to the Lord in prayer." I can say with the Psalmist, "I had fainted unless I had believed to see the goodness of the Lord in the land of the living." "Wait on the Lord; be of good courage, and he shall strengthen thy heart; wait, I say, on the Lord" STEPHEN J. HARMELING.
Marion, S. Dak., Feb. 22.

Friend Root:—I was a bee-keeper before GLEANINGS started, and I have read nearly all the periodicals published on bee culture. The first paper I remember reading was published by H. A. King & Co., of New York, dating back to 1873, and we have one copy of that paper yet. As to the exact date when I became acquainted with GLEANINGS I don't remember; but I remember quite well the photo of yourself with Blue Eyes sitting on your knee, and when you signed yourself "Novice" I have been a subscriber nearly every year since, and have followed its teachings all the way through to the present time. "Our Homes" I have been interested in, and have read and practiced its teachings. While we have been reading and practicing what GLEANINGS has taught, we never met its editor until the Omaha convention, at which time we saw other old-time writers such as Dr. Miller, G. W. York, Dr. Mason, and others. We are still bee-keeping, and like to work with and handle bees, as well as when we first commenced. J. M. YOUNG.
Plattsmouth, Neb., Jan 10.

Dear Mr. Root:—I think it was in 1871 when Mr. Axtell and I began keeping bees; and about two years later we began taking GLEANINGS. I well remember what a real comfort a letter from you to us about that time was, in answer to whether our bees were put up right for wintering, as we felt a good deal as if groping in the dark, though we had read every thing on bees we could hear of, reading and re-reading, and committing to memory directions given in books and papers. We have taken GLEANINGS ever since.

GLEANINGS has been a great help to us in many ways besides in helping us to understand bee culture. The Home Papers have been a source of comfort and strength, and generally the first read.

The first few years the honey crop was short, and bees did not pay largely; then for about ten years we had scarcely a failure; but the past few years honey crops have again been poor, and some years would be almost a failure except for the benefit to my health in working out of doors, and perhaps the benefit of bee-stings, as I have had some days as many as ten to fifty.

I have hardly felt like calling any year a failure, because of the benefit the bees have been to my health and happiness.

The largest amount secured in any one year was in 1882—39,000 lbs. of comb honey, except about 500 lbs. of extracted, from 180 colonies, spring count, and increased to 298. The following winter was very hard on bees, and we lost over 100 colonies, which taught us to go back to the Quinby mode of giving room under brood-frames, and packing hives with chaff, which will give successful wintering out of doors if the honey is good, and large entrances when wintered in cellar. MRS. L. C. AXTELL.
Roseville, Ill., Mar. 2.

Just now the men seem to have the floor. Although not a veteran, I am a subscriber, and I do enjoy reading GLEANINGS. In reading of your wheel-trips I was tempted to buy a wheel, and have been riding two years, and like it. At first I thought I was too old to ride one, as I was born in 1838. I do errands on it, make calls, and even go to church on it. Women have said to me, "I glory in your wheel." I can blame it all on Mr. Root. I thought he was not going to have *all* the fun in his old days. Sister bee-keepers, where are you? Let us not let the men have all the say. Success to A. I. Root and GLEANINGS is my wish.
Bilmond, Ia., Feb. 27. MRS. J. H. ALLISON.